Rio Blanco
Oil Shale Project

PROGRESS REPORT 11

GEOTECHNICAL DATA GATHERING PROJECT

HYDROLOGIC PROGRAM
SECTION 1.2
INTERPRETIVE TEXT WITH
FINAL ENVIRONMENTAL BASELINE REPORT
FOR 84 MESA AND
RAW DATA APPENDICES

To Area Oil Shale Supervisor
United States Geological Survey

by
Wright Water Engineers
for
Gulf Oil Corporation
and
ndard Oil Company (Indiana)

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PROGRESS REPORT 11
MARCH, APRIL, MAY 1977
GEOTECHNICAL DATA GATHERING PROJECT
HYDROLOGIC PROGRAM
SECTION 1.2

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INTERPRETIVE TEXT
WITH
FINAL ENVIRONMENTAL BASELINE REPORT
FOR
84 MESA

SEPTEMBER 1977

TO
AREA OIL SHALE SUPERVISOR
UNITED STATES GEOLOGICAL SURVEY

BY
WRIGHT WATER ENGINEERS, INC.
FOR
GULF OIL CORPORATION
AND
STANDARD OIL COMPANY (INDIANA)

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1.2 HYDROLOGIC PROGRAM

The purpose of the surface and subsurface hydrologic baseline program conducted for the Rio Blanco Oil Shale Project (RBOSP) was to establish baseline data. These data include: precipitation, stream flows and water quality, alluvial aquifer monitoring and water quality analyses, and deep oil shale aquifer monitoring and water quality analyses.

RBOSP Progress Reports 2 through 10 have presented the two years of baseline data collected for Tract C-a. These data have been analyzed and the results are reported in the Final Baseline Report.

RBOSP Progress Report 11 submits to the AOSS the hydrologic data gathered or received during the period March 1977 through May 1977 and interpretations of hydrologic baseline data for the proposed processed shale disposal site on 84 Mesa. This hydrologic report is submitted in two parts: The Interpretive Text and the Raw Data.

Sections 1.2.1 through 1.2.7 are the text, tables, and figures resulting from the data gathering program; Section 1.2.8 is the Hydrologic Program Summary which presents the analysis of the two years' baseline data for the proposed processed shale disposal site, 84 Mesa. The Raw Data Section contains the actual data (in computer printout form) and back-up data for the Baseline Report.

The following is a brief summary of the previous Quarterly Reports:

- Progress Report 2 - Contains data from the drilling program;
- Progress Report 3 - Contains data obtained during the formal pumping tests;
- Progress Report 4 - Contains a detailed hydrologic evaluation of the data available through October 15, 1975;

- Progress Report 5 - Summarizes the annual hydrologic data for water year 1975;
- Progress Report 6 - Contains data and the interpretation for the sixth quarterly period, December through February 1976;
- Progress Report 7 - Contains data and the interpretation for the seventh quarterly period, March through May 1976;
- Progress Report 8 - Contains data and the interpretation for the eighth quarterly period, June through August 1976;
- Progress Report 9 - Contains data and interpretation for the ninth quarterly period, September through November 1976.
- Progress Report 10 - Contains data and interpretation for the tenth quarterly period, December 1976 through February 1977 and for the Final Baseline Report.

The hydrologic program began in the spring of 1974. These data have been used in both environmental and engineering studies. Analyses of the water quality data to date indicate that the water will be of sufficient quality to be used in mining and processing related to oil shale development.

1.2.1 SURFACE WATER MONITORING STATIONS

RBOSP has contracted with the Colorado River Water Conservation District to have the Water Resources Division of the USGS construct and monitor a total of eleven stream gaging stations and six rain gaging stations on or near Tract C-a. RBOSP Progress Reports 2, 3, and 5 described the operation of these monitoring stations. Of the eleven stream gaging stations, seven monitor all significant drainages associated with Tract C-a, while the remaining four stations monitor stream flow associated with the proposed shale disposal site on 84 Mesa. The three storage-type rain gaging stations are located on Dry Fork, on Box Elder Gulch, and on Corral Gulch near the west line of Tract C-a. Rainfall intensity and recording-type rain gaging stations are located near the drainage divide of Cathedral Bluffs, on Stake Springs Draw near the confluence with Corral Gulch, and on Yellow Creek near White River, Colorado.

Table 1.2-1 gives the USGS identification numbers and locations of the eleven stream gaging stations and the six rain gaging stations.

Figure 1.2-1 gives the location of the eleven stream and six rain gaging stations.

TABLE 1.2-1

LOCATION AND USGS IDENTIFICATION NUMBERS FOR STREAM AND RAIN GAGING STATIONS

USGS Identification Number	LOCATION
09306237	Dry Fork near west line Tract C-a
09306235	Corral Gulch near west line Tract C-a
09306240	Box Elder Gulch near west line Tract C-a
09306242	Corral Gulch east of Tract C-a
09306230	Stake Springs Draw near confluence with Corral Gulch
09306255	Yellow Creek near White River, Colorado
09306241	Rinky Dink Gulch near east line Tract C-a
09306248	Upper Big Duck Creek north of 84 Mesa
09306250	Lower Big Duck Creek north of 84 Mesa
09306246	Tributary to Yellow Creek east of 84 Mesa
09306244	Corral Gulch south of 84 Mesa (near 84 Ranch)
	STORAGE-TYPE RAIN GAGES
09306235	Corral Gulch near west line Tract C-a
09306237	Dry Fork near west line Tract C-a
09306240	Box Elder Gulch near west line Tract C-a
	RAINFALL INTENSITY AND RECORDING RAIN GAGES
09306230	Stake Springs Draw near confluence with Corral Gulch
09306255	Yellow Creek near White River, Colorado
No number	Cathedral Bluffs located in NW¼, NW¼, Sec.14 T2S, R100W

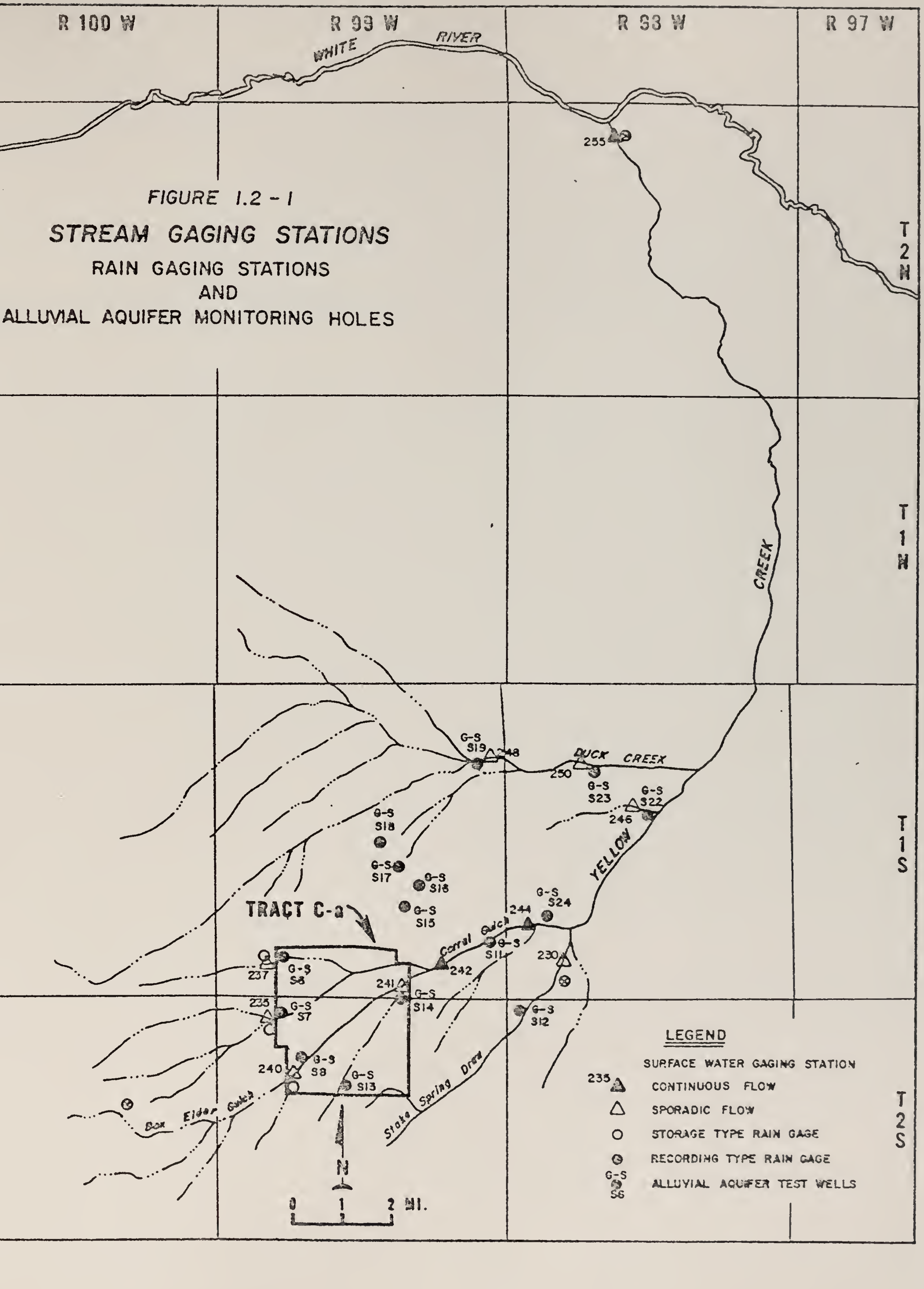


FIGURE 1.2 - 1

STREAM GAGING STATIONS

RAIN GAGING STATIONS AND ALLUVIAL AQUIFER MONITORING HOLES

1.2.2 SURFACE WATER DATA COLLECTION

The 2-year baseline data collection for Tract C-a from the seven associated stream gaging stations and the six rain gaging stations has been completed and the additional studies are supported in the Semi-Annual Report. Surface water data collection for baseline data for the four stream gaging stations associated with the proposed processed shale disposal site on 84 Mesa has been completed.

This report will complete the presentation of baseline surface water data for 84 Mesa with the exception of sediment data. Analysis of the baseline data collected has been completed and is included in section 1.2.8 of this report. Sediment data has not been processed at this time by the U.S.G.S. After the data are processed, they will be analyzed and submitted to the AOSS.

New baseline data collection for the following four stream gaging stations associated with 84 Mesa covers the reporting period March through May, 1977: Upper Big Duck Creek north of 84 Mesa, Lower Big Duck Creek north of 84 Mesa, Unnamed Tributary to Yellow Creek east of 84 Mesa, and Corral Gulch south of 84 Mesa. Table 1.2-2 is the data collection schedule for the four stream gaging stations. Three of the four stream gaging stations for 84 Mesa did not have flow during the reporting period. These three are Upper Big Duck Creek north of 84 Mesa, Lower Big Duck Creek north of 84 Mesa, and Unnamed Tributary to Yellow Creek east of 84 Mesa.

Flow was monitored for the entire reporting period at the Corral Gulch south of 84 Mesa location. Flow during this period averaged 0.06 cubic feet per second (cfs) of discharge. Flow during this period followed the spring snowmelt pattern as flow had alternating periods of highs and lows. A much lower flow occurred during this period than the previous year as a result of a drier winter. Figure 1.2-2 is a plot of the daily mean discharge at this station.

Figures 1.2-3 and 1.2-4 are graphs of available continuous mean temperature and conductivity. Low flow and freezing conditions limited the ability ot collect continuous temperature and continuous conductivity measurements. The available continous mean temperature data show a rise in temperature through the spring months. Continuous conductivity data are variable and, thus, no analysis can be made from this data.

Due to scheduling problems in water sampling procedures, water samples were only collected in March and April of this reporting period by the USGS. Table 1.2-3 presents the results of this analysis.

Included in the Appendix of this report is the finalized water quality data for the Tract C-a stream gaging station, water year 1975 as reported by the USGS.

TABLE 1.2-2

DATA COLLECTION SCHEDULE FOR STREAM GAGING STATIONS

Continuously or Automatically

- Flow Rate
- Sediment Discharge
- Temperature
- Specific Conductance

Periodically

- Storage Rain Gages
- Recording Rain Gages
- Rainfall Intensity Gages

Monthly

Water Samples Analyzed For:

- Alkalinity
- Biological Oxygen Demand
- Dissolved Organic Carbon
- Boron
- Calcium
- Conductance
- Fluoride
- Magnesium
- Potassium
- Silica
- Sodium
- Sulfate
- Ammonia
- Bicarbonate
- Carbonate
- Chloride
- Color
- Dissolved Solids
- Kjeldahl Nitrogen
- Nitrate plus Nitrite
- Odor
- Dissolved Phosphate
- Turbidity
- Dissolved Oxygen
- pH
- Temperature
- Total Phosphate
- Ortho Phosphate
- Suspended Organic Carbon

Quarterly

Sample and Analyze:

- COD
- Fecal Coliform
- Total Coliform
- Bromide
- Cyanide
- MBAS
- Oil & Grease
- Phenols
- Sulfide
- Radioactivity
  - Gross Alpha
    - if > 4 pci/l
    - then Ra^{226},
    - Natural Uranium
  - Gross Beta
    - if >100 pci/l
    - then Sr^{90}
    - Ce^{137},
- Ba
- Be
- Ge
- Ga
- Ni
- Ti
- V
- Zr
- Al
- As
- Cd
- Cr
- Cu
- Fe
- Pb
- Li
- Mn
- Mo
- Hg
- Se
- Sr
- Zn

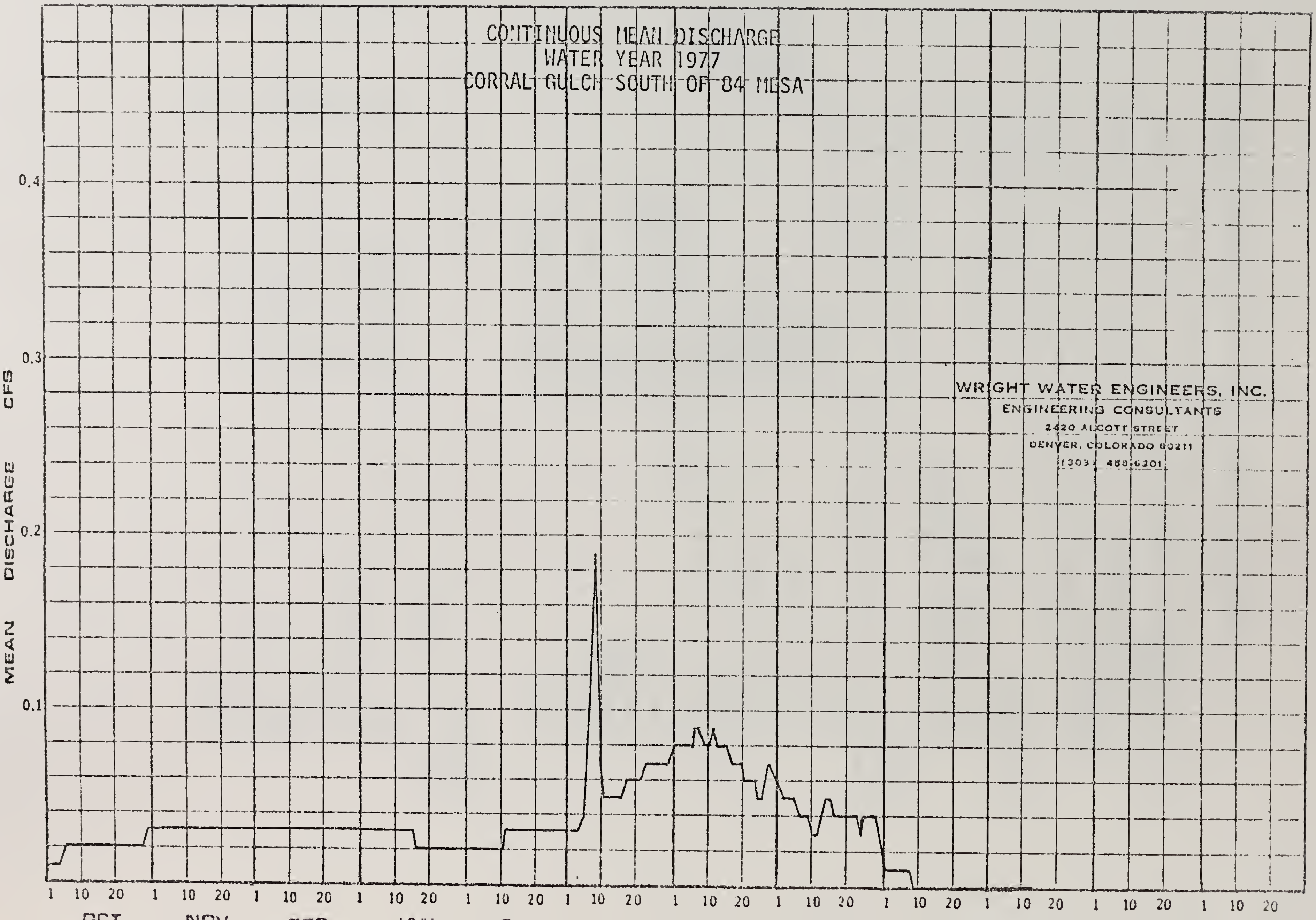

CONTINUOUS MEAN DISCHARGE
WATER YEAR 1977
CORRAL GULCH SOUTH OF 84 MESA
WRIGHT WATER ENGINEERS, INC.
ENGINEERING CONSULTANTS
2420 ALCOTT STREET
DENVER, COLORADO 80211
(303) 480-6201
MEAN DISCHARGE CFS
0.4
0.3
0.2
0.1
1 10 20 1 10 20 1 10 20 1 10 20 1 10 20 1 10 20 1 10 20 1 10 20 1 10 20 1 10 20 1 10 20 1 10 20

FIGURE 1.2-2

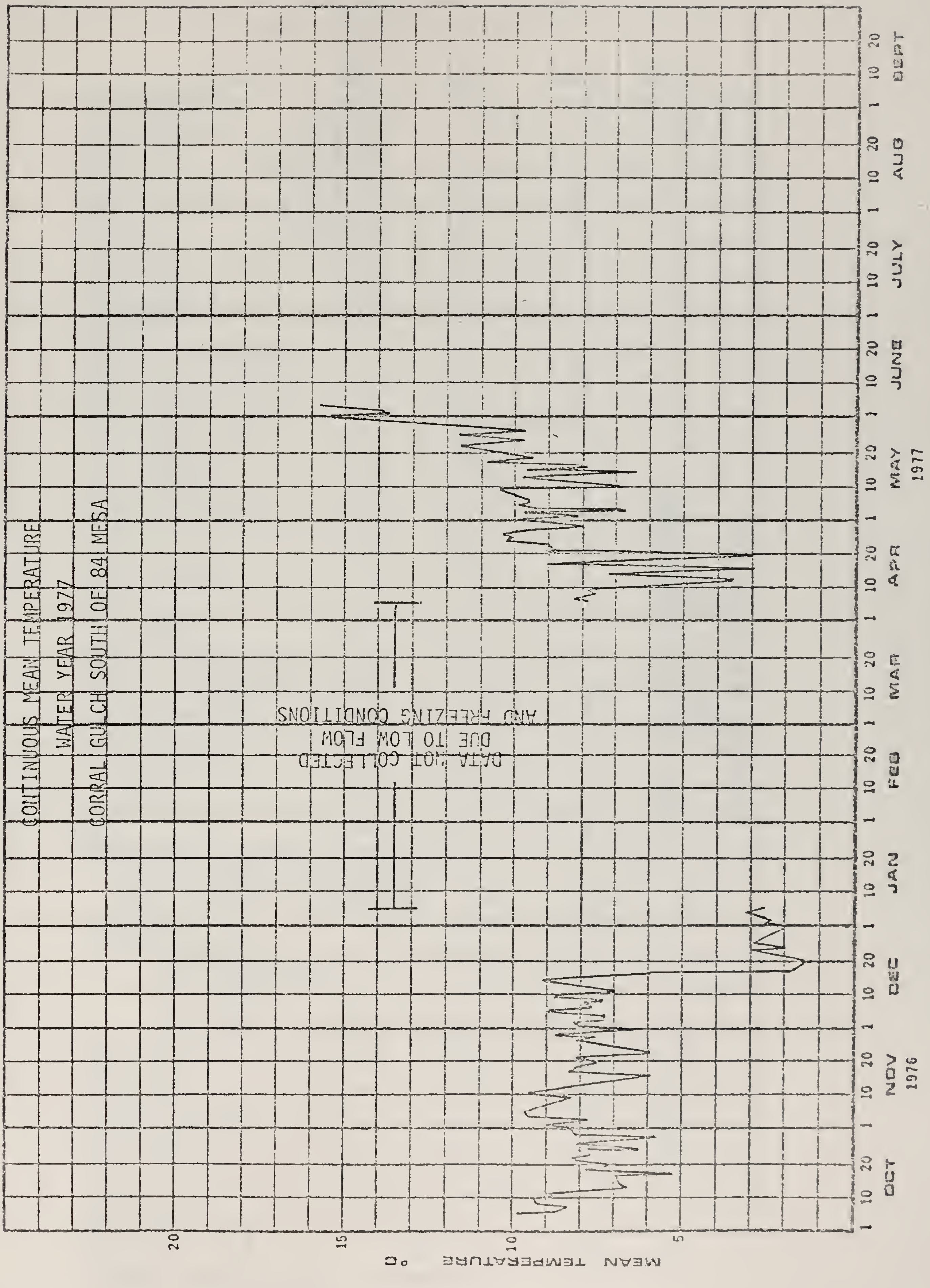
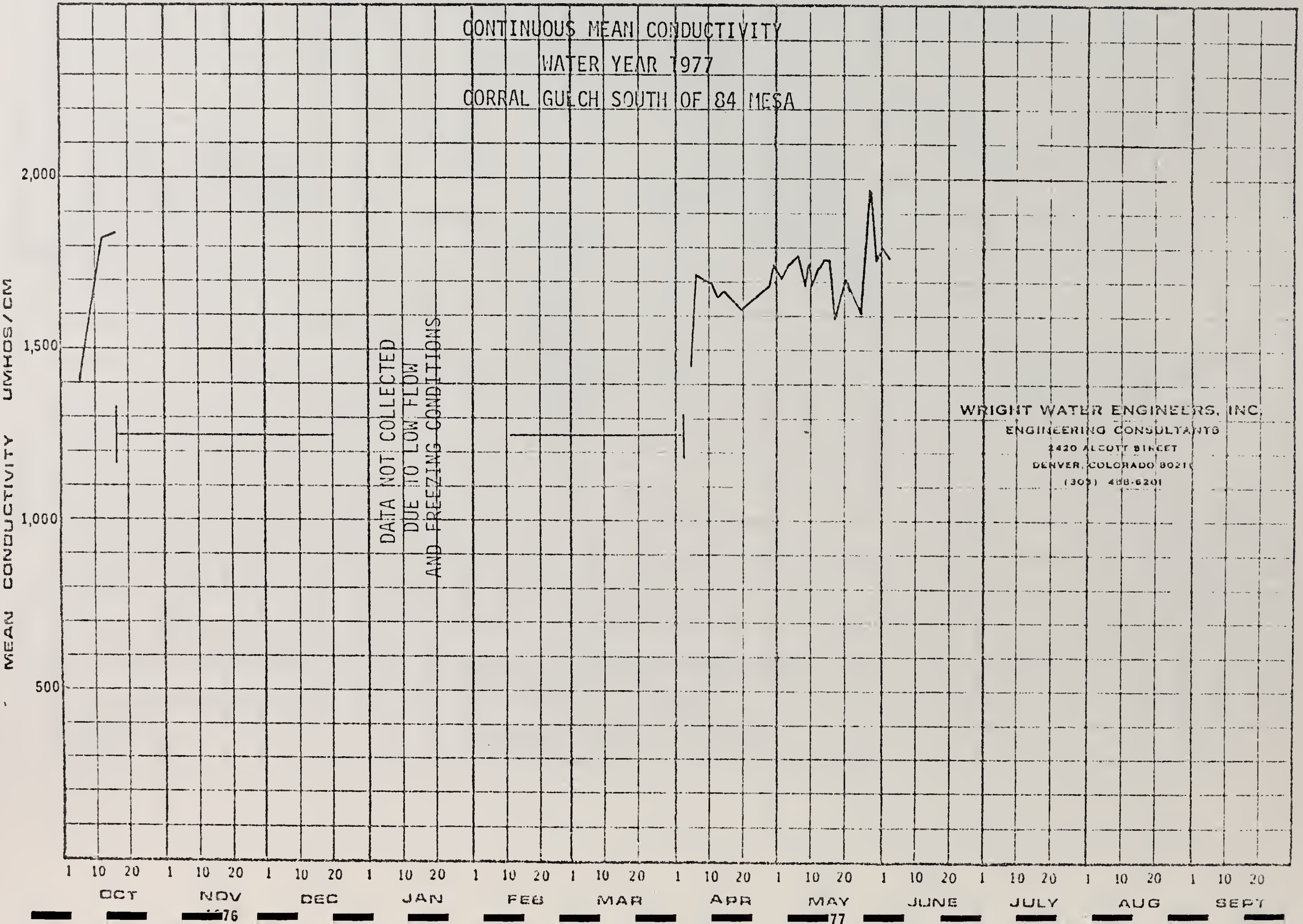

CONTINUOUS MEAN TEMPERATURE
WATER YEAR 1977
CORRAL GULCH SOUTH OF 84 MESA
DATA NOT COLLECTED
DUE TO LOW FLOW
AND FREEZING CONDITIONS
MEAN TEMPERATURE °C
5
10
15
20
1 10 20 OCT
1 10 20 NOV 1976
1 10 20 DEC
1 10 20 JAN
1 10 20 FEB
1 10 20 MAR
1 10 20 APR
1 10 20 MAY 1977
1 10 20 JUNE
1 10 20 JULY
1 10 20 AUG
1 10 20 SEPT

FIGURE 1.2-3



CONTINUOUS MEAN CONDUCTIVITY
WATER YEAR 1977
CORRAL GULCH SOUTH OF 84 MESA

FIGURE 1.2-4

TABLE 1.2-3
SUMMARY WATER ANALYSIS
STREAM GAGING STATION, USGS 09306244
CORRAL GULCH AT 84 RANCH

Item	Oct. 13	Feb. 23	Nov. 17	Apr. 19
Alkalinity (mg/l)	425	519	480	510
Aluminum (ug/l)*	--	--	--	20
Ammonia (NH_4) (mg/l)	0.01	0.06	0.01	0.05
Arsenic (ug/l)*	--	--	--	2
Barium (ug/l)*	--	--	--	--
Beryllium (ug/l)*	--	--	--	--
Bicarbonate (mg/l)	518	633	588	620
Bismuth (ug/l)+	--	--	--	--
BOD, 5-Day (mg/l)	--	--	--	--
Boron (ug/l)	200	180	170	150
Bromide (mg/l)*	--	--	--	0.0
Cadmium (ug/l)*	--	--	--	1
Calcium (mg/l)	110	100	99	100
Carbonate (mg/l)	0	0	0	0
Chloride (mg/l)	20	18	15	21
Chromium (ug/l)*	--	--	--	0
COD (mg/l)*	--	--	--	22
Coliform, Fecal (Col/100 ml)*	--	--	--	--
Coliform, Total (Col/100 ml)*	--	--	--	--
Color (PCU)	4	12	25	6
Conductivity, Specific (umhos)	1850	1800	1520	1780
Copper (ug/l)*	--	--	--	1
Cyanide (mg/l)*	--	--	--	0
Dissolved Oxygen (mg/l)	12.7	8.5	12.3	12.0
Fluoride (mg/l)	0.3	0.3	0.4	0.4
Gallium (ug/l)*	--	--	--	--
Germanium (ug/l)*	--	--	--	--
Hardness (Ca, Mg) (mg/l)	730	700	650	710
Iron (ug/l)*	--	--	--	100
Kjeldahl Nitrogen (N) (mg/l)	0.29	0.46	0.74	0.41
Lead (ug/l)*	--	--	--	3
Lithium (ug/l)*	--	--	--	10
Magnesium (mg/l)	110	110	98	110
Manganese (ug/l)*	--	--	--	100
MBAS (mg/l)*	--	--	--	--
Mercury (ug/l)*	--	--	--	0.0
Molybdenum (ug/l)	--	--	--	40
Nickel (ug/l)*	--	--	--	--
Nitrate (NO_3) (mg/l)	--	--	--	--
Nitrogen - Nitrite as N (mg/l)	--	--	--	--
Nitrite Plus Nitrate (N)(mg/l)	0.02	0.21	0.09	0.24
Nitrogen, Ammonia (mg/l)	0.01	0.05	0.01	0.04
Nitrogen, Organic (mg/l)	0.28	0.41	0.73	0.37
Odor (severity)	1	--	--	--
Oil and Grease (mg/l)*	--	--	--	0
Organic Carbon (mg/l)				
Dissolved	6.7	9.9	8.8	13.0
Suspended	0.1	1.0	0.7	0.8
Total +	--	--	--	--
Pesticides (ug/l) +	--	--	--	--
pH	8.4	8.6	8.3	8.2
Phenols (mg/l)*	--	--	--	0
Phosphate (mg/l)				
Dissolved (PO_4)	--	--	--	--
Ortho (P)	0.02	0.09	0.15	0.12
Total (PO_4)	0.03	0.06	0.18	0.06
Potassium (mg/l)	2.3	3.0	2.8	2.3
Radioactivity*				
Gross Alpha (pc/l)[1]	--	--	--	14
Radium 226 (pc/l)	--	--	--	0.11
Natural Uranium (ug/l)	--	--	--	5.6
Gross Beta (pc/l)				
SR^{90} (pc/l)	--	--	--	7.1
CE^{137} (pc/l)	--	--	--	8.7
Selenium (ug/l)	--	--	--	2
Silica (SiO_2) (mg/l)	22	19	16	17
Silver (ug/l) +	--	--	--	--
Sodium (mg/l)	190	180	170	180
Sodium Adsorption Ratio	3.1	3.0	2.9	3.0
Solids, Dissolved (mg/l)	129	1300	1170	1290
Strontium (ug/l)*	--	--	--	2700
Sulfate (mg/l)	580	550	480	550
Sulfide (mg/l)*	--	--	--	0.6
Temperature (°C)*	7.5	8.5	6.0	7.0
Tin (ug/l) +	--	--	--	--
Titanium (ug/l)	--	--	--	--
Turbidity (JTU)	0	--	--	--
Vanadium (ug/l) *	--	--	--	--
Zinc (ug/l)*	--	--	--	20
Zirconium (ug/l) *	--	--	--	--

* Quarterly or special sampling only

+ Required during first year baseline only

1 U Nat as reference

1.2.3 ALLUVIAL AQUIFERS

The drilling and completion of 15 alluvial aquifer test holes associated with Tract C-a were described in RBOSP Progress Reports 2, 3, and 4. The holes which encountered water were: G-S S7, G-S S-8, G-S S-11, G-S S12, G-S S-19, G-S S-22, G-S S-23, and G-S S-24. Figure 1.2-1 shows the location of all of the alluvial aquifer test holes.

The remaining seven alluvial aquifer test holes were drilled to bedrock in the alluvium and were dry. Three of the dry alluvial test holes (G-S S-6, G-S S-13, and G-S S-14) were drilled as part of the monitoring of Tract C-a and have remained dry for the 2 years of baseline monitoring. The dry alluvial test holes (G-S S-15, G-S S-16, G-S S-17, and G-S S-18) were drilled in association with the proposed 84 Mesa disposal site and have remained dry during the monitoring to date.

Baseline data gathering of the wet alluvial aquifer test holes (G-S S-7, G-S S-8, G-S S-11, G-S S-12) associated with Tract C-a was completed in February 1977. RBOSP Progress Report 10 completed the reporting of the baseline data. The analysis of baseline data is reported in the Final Baseline Report. Future monitoring of these test holes will be reported in the Semi-Annual Interim Monitoring Reports.

Baseline data gathering of the wet alluvial aquifer test holes, G-S S-19, G-S S-22, G-S S-23, and G-S S-24, associated with the proposed processed shale disposal site on 84 Mesa will be completed by this Progress Report. This report presents the data collected for the December 1976 through February 1977 period. Future monitoring of these test holes will be reported in Semi-Annual Interim Monitoring Reports.

Table 1.2-4 is a data collection schedule for the alluvial aquifers which were used for the alluvial test holes associated with Tract C-a and presently covers the four wet alluvial aquifer test holes associated with 84 Mesa. According to the schedule approved by the AOSS for the alluvial aquifer monitoring program, samples for standard chemical analysis should be collected in February, July, November, and monthly during the snowmelt flash flood season from April through September. The schedule also requires that all samples from the alluvial holes be filtered prior to laboratory analysis. This process is done in the field by means of a pressurized filtration unit. Table 1.2-5 presents the results of the physical and chemical field measurements of the alluvial aquifers.

Figures 1.2-5 through 1.2-8 are hydrographs showing the depth to water of the four alluvial aquifer monitoring holes for Water Year 1977. The measured water levels in the alluvial holes have fallen over the quarter. The measured water level of alluvial hole G-S S-19 showed a continuous decline during the quarter. G-S S-22 showed a rise in water level from March 1977 to April 1977, but dropped from April to May 1977. The water level in G-S S-23 rose from February 1977 to March, but dropped a total of 7.31 feet between February and May. The water level measurements in alluvial hole G-S S-24 had a slight drop between February and March 1977, a rise at the April measurement, and a drop of 0.74' between April and May 1977.

Water samples were collected in both April and May of this reporting period. The laboratory results are reported in the Raw Data Section of the appendix.

Tables 1.2-6 and 1.2-7 are statistical summaries of both qualitative and quantitative chemical analyses from the alluvial aquifer sampling program.

TABLE 1.2-4

DATA COLLECTION SCHEDULE FOR ALLUVIAL HOLES

Monthly

Water Levels Measured

February, July, November Plus Snowmelt-Flash Flood Seasons (April to Sept.)

Water Samples Analyzed For:

- Alkalinity
- Ammonia
- Boron
- Bicarbonate
- Calcium
- Carbonate
- Chloride
- Conductance
- Dissolved Organic Carbon
- Dissolved Solids
- Fluoride
- Iron
- Magnesium
- Manganese
- Kjeldahl Nitrogen
- Nitrate plus Nitrite
- Orthophosphate
- Dissolved Phosphate Potassium
- Silica
- Sodium
- Sulfate
- Color
- Odor
- pH
- Temperature

February, July, November

Water Samples Analyzed For:

- DO
- Bromide
- Cyanide
- BOD
- COD
- Phenols
- Sulfide
- Radioactivity
  - Gross Alpha
    - If >4 pci/l
      - then
        - RA 226,
        - Natural Uranium
  - Gross Beta
    - If >100 pci/l
      - then
        - SR^{90}
        - Ce^{137}
- Ba
- Be
- Bi
- Ge
- Ga
- Ni
- Sr
- Ti
- V
- Zr
- Al
- As
- Cd
- Cr
- Cu
- Pb
- Li
- Mo
- Hg
- Se
- Se
- Sr
- Zn

July or August

Samples Analyzed For:

- Fecal Coliform
- Total Coliform
- MBAS

TABLE 1.2-5

ALLUVIAL AQUIFER PHYSICAL AND CHEMICAL FIELD MEASUREMENTS

MARCH, APRIL, MAY 1977

Observation Hole No.	Date of Sample	Depth to Water Below Ground Surface (feet)	Temperature ^{o}C	Specific Conductance umhos/cm	pH
G-S S-19	3/3/77	55.36	*	*	*
	4/19/77	55.96	10.2	1380	6.4
	5/9/77	57.40	**	**	**
G-S S-22	3/3/77	65.46	*	*	*
	4/19/77	64.19	9.0	1085	6.7
	5/9/77	72.50	11.3	1180	6.8
G-S S-23	3/3/77	29.71	*	*	*
	4/19/77	30.62	8.0	1675	6.3
	5/9/77	37.02	10.8	1900	6.4
G-S S-24	3/3/77	6.95	*	*	*
	4/19/77	6.78	6.0	1650	6.4
	5/9/77	7.52	11.0	1740	6.0

* Water levels only measured during month

** Insufficient water, no sample collected

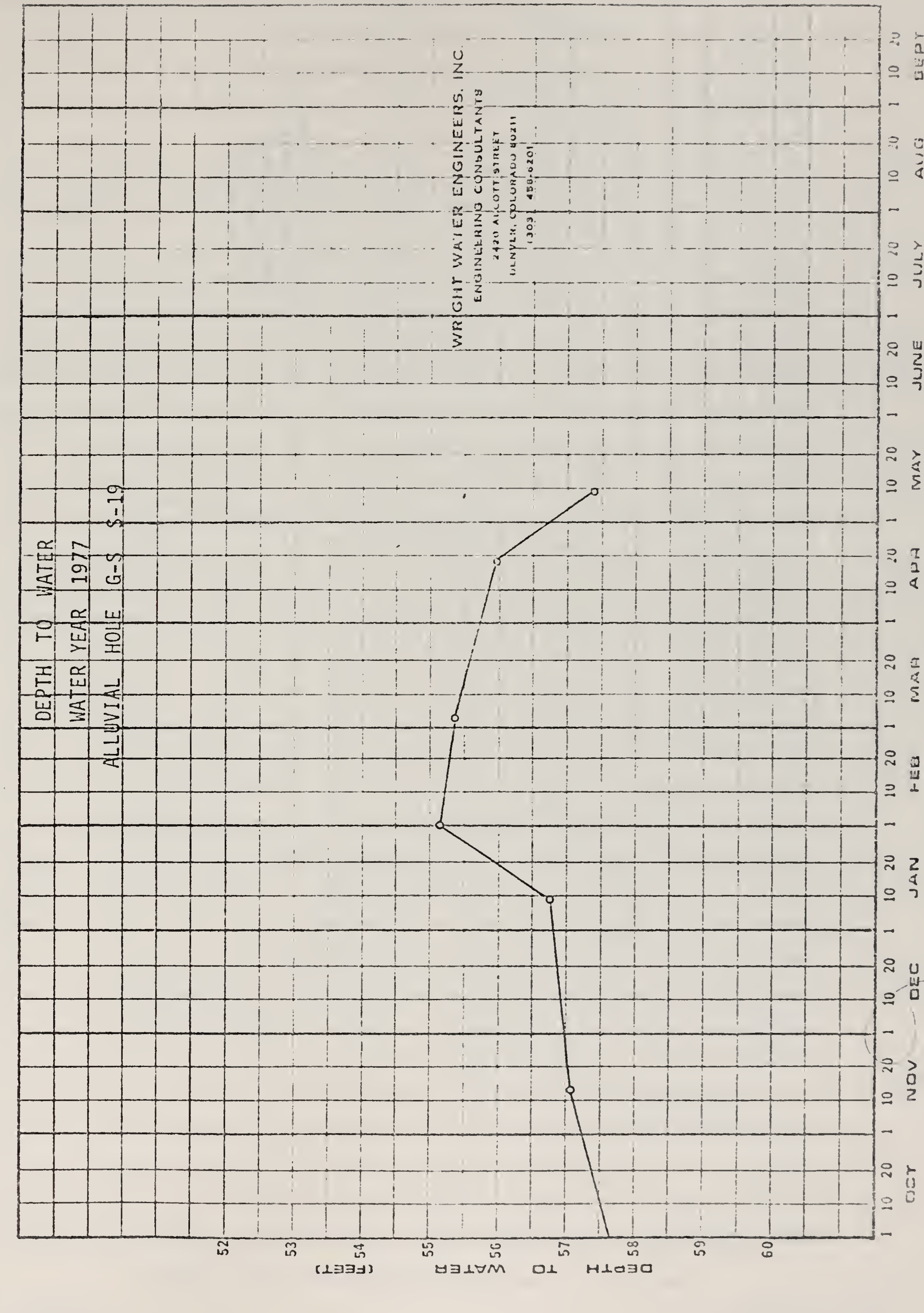

DEPTH TO WATER
WATER YEAR 1977
ALLUVIAL HOLE G-S S-19
WRIGHT WATER ENGINEERS, INC.
ENGINEERING CONSULTANTS
2420 ALCOTT STREET
DENVER, COLORADO 80211
(303) 458-6201
DEPTH TO WATER (FEET)
52
53
54
55
56
57
58
59
60
OCT
NOV 1976
DEC
JAN
FEB
MAR
APR
MAY 1977
JUNE
JULY
AUG
SEPT
1
10
20

FIGURE 1-2.5

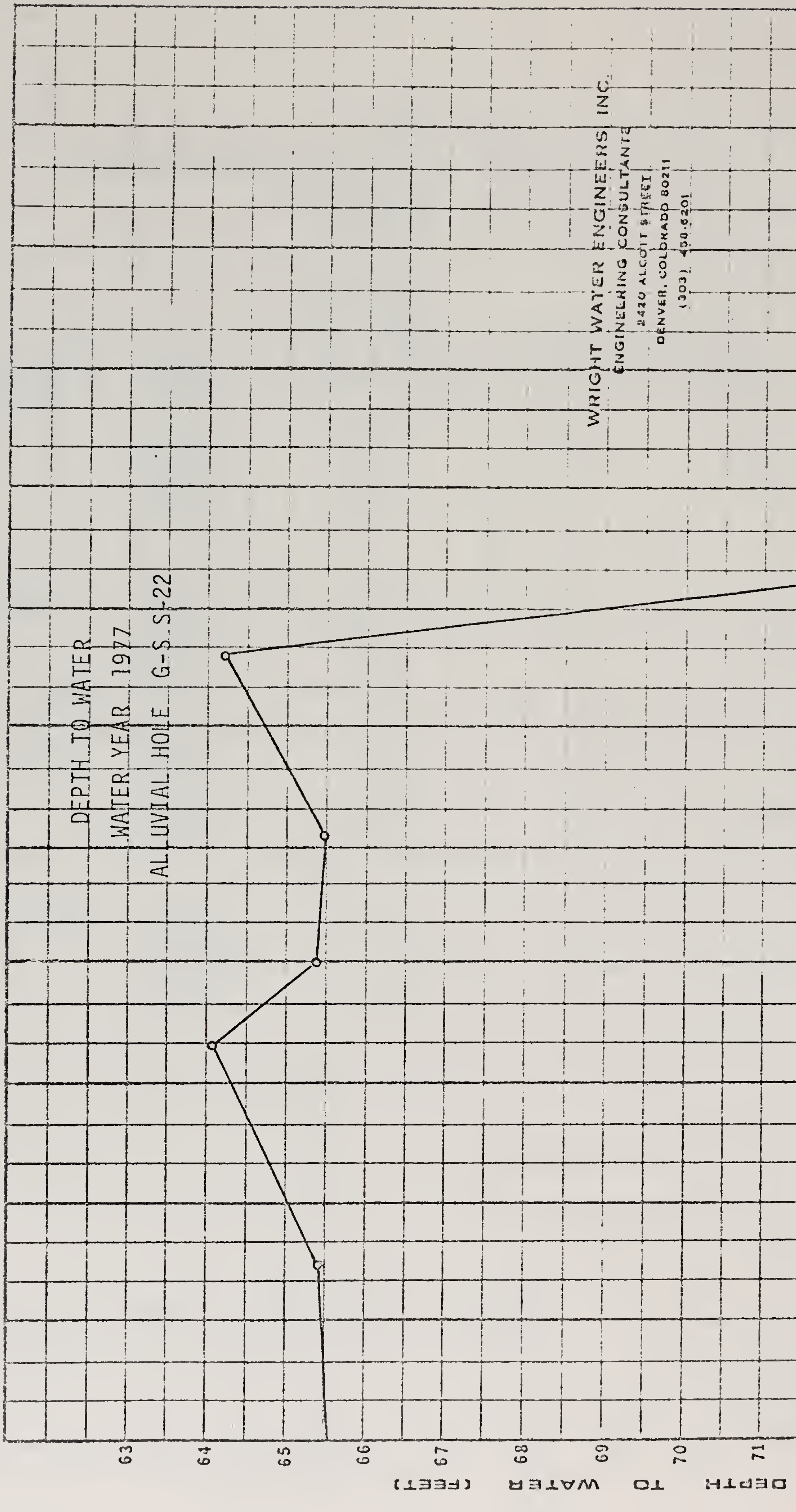

DEPTH TO WATER
WATER YEAR 1977
ALLUVIAL HOLE G-S S-22
WRIGHT WATER ENGINEERS, INC.
ENGINEERING CONSULTANTS
2420 ALCOTT STREET
DENVER, COLORADO 80211
(303) 458-6201
DEPTH TO WATER (FEET)
63
64
65
66
67
68
69
70
71
72
73
1 10 20 OCT
1 10 20 NOV
1 10 20 DEC
1 10 20 JAN
1 10 20 FEB
1 10 20 MAR
1 10 20 APR
1 10 20 MAY
1 10 20 JUNE
1 10 20 JULY
1 10 20 AUG
1 10 20 SEPT
1976
1977

FIGURE 1.2-6

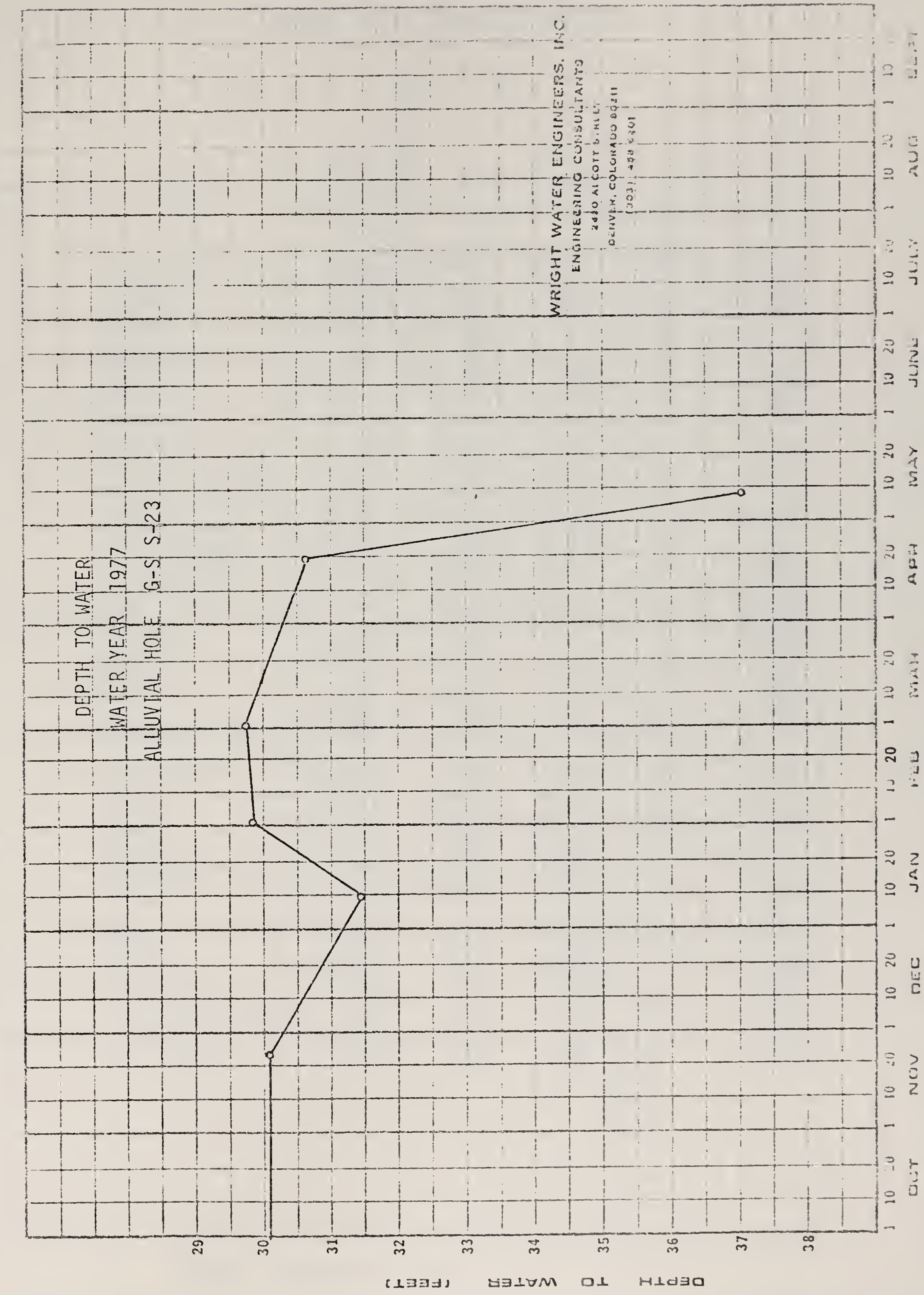

DEPTH TO WATER
WATER YEAR 1977
ALLUVIAL HOLE G-S S-23
WRIGHT WATER ENGINEERS, INC.
ENGINEERING CONSULTANTS
2490 ALCOTT STREET
DENVER, COLORADO 80211
(303) 480 [illegible]
DEPTH TO WATER (FEET)
29
30
31
32
33
34
35
36
37
38
OCT
NOV
1976
DEC
JAN
FEB
MAR
APR
MAY
1977
JUNE
JULY
AUG
SEPT
1
10
20

FIGURE 1.2-7

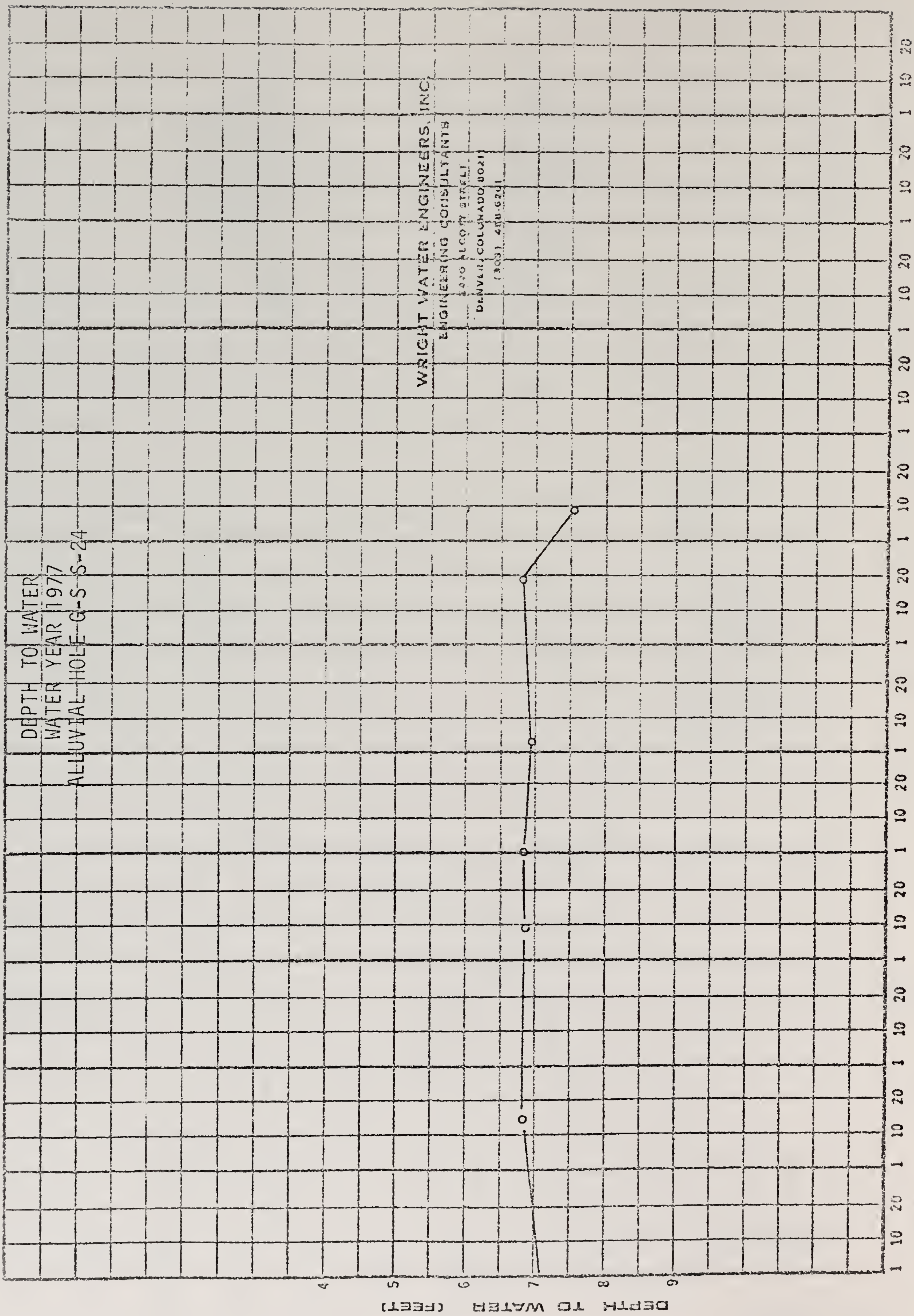

DEPTH TO WATER
WATER YEAR 1977
ALLUVIAL HOLE G-S S-24
WRIGHT WATER ENGINEERS, INC.
ENGINEERING CONSULTANTS
2490 ALCOTT STREET
DENVER, COLORADO 80211
(303) 480-6201
DEPTH TO WATER (FEET)
4
5
6
7
8
9
1 10 20 OCT
1 10 20 NOV 1976
1 10 20 DEC
1 10 20 JAN
1 10 20 FEB
1 10 20 MAR
1 10 20 APR
1 10 20 MAY 1977
1 10 20 JUNE
1 10 20 JULY
1 10 20 AUG
1 10 20 SEPT

FIGURE 1.2-8

TABLE 1-2.6

SUMMARY OF WET CHEMICAL ANALYSIS COMBINED ALLUVIAL AQUIFERS

Values in mg/l

Item	Low	High	Average	# Items Averaged	Std. Dev.
Alkalinity	51.000	1505.000	474.877	162	123.036
Aluminum	< 0.100	1.200	0.127	26	0.285
Ammonia	0.030	6.4	0.537	107	0.883
Arsenic	< 0.010	< 0.100		118	
Barium	< 1.000	< 1.000		96	--
Bicarbonate	360.000	810.000	564.380	163	99.851
Boron	< 0.010	27.000	.958	154	2.626
Cadmium	< 0.010	1.100	0.027	126	0.105
Calcium	28.000	240.000	96.221	163	34.946
Carbonate	< 0.010	120.000	7.006	162	16.843
Chloride	1.300	71.000	17.682	163	8.725
Chromium	< 0.010	0.200	0.007	125	0.034
Conductivity (umhos/cm)	860.000	2275.000	1550.934	161	342.551
Copper	< 0.010	8.000	0.424	126	1.117
Cyanide	< 0.010	0.200	0.003	125	0.019
Dissolved Solids	640.000	2090.000	1190.679	162	285.180
Fluoride	< 0.100	1.200	.323	162	.171
Gross Alpha (pci/l)	0.200	31.000	10.977	99	6.802
Gross Beta (pci/l)	1.000	35.000	12.644	36	9.542
Hardness (total)	280.000	820.000	604.770	148	140.345
Iron	< 0.050	28.000	4.486	163	5.744
Lead	0.010	13.000	0.310	125	1.166
Magnesium	3.700	160.000	89.755	163	37.385
Manganese	< 0.050	27.000	2.219	154	4.086
Mercury	< 0.001	< 0.010		126	
Nickel	0.010	0.200	0.074	96	0.057
Nitrate	< 0.100	165.000	6.387	148	14.465
pH	< 6.000	7.200	6.403	151	.609
Phosphate	< 0.010	1.600	.076	160	.185
Selenium	< 0.010	< 0.100		126	
Silicon Dioxide	16.000	44.000	29.515	163	5.287
Silver	< 0.010	< 0.100	0.007	95	0.013
Sodium	66.000	450.000	188.755	163	58.022
Sulfate	150.000	1000.000	461.902	163	154.311
Zinc	0.010	13.000	0.583	124	1.332
Potassium	< 1.000	16.000	4.862	66	3.712
Lithium	< 0.100	0.100	0.007	30	0.025
Total Organic Carbon	2.900	292.000	41.650	117	56.977
Nitrite -N	< 0.010	150.000	4.555	59	20.343
Bromide	< 0.010	0.900	0.273	22	0.349
Chemical Oxygen Demand	< 1.000	85.000	17.607	30	16.697
Phenols	< 0.001	0.013	0.001	28	0.004
Kjeldahl N	< 0.100	16.000	2.172	67	2.492
Beryllium	< 0.020	2.500	0.612	8	0.884
Ortho Phosphate	< 0.100	1.000	0.043	61	0.141
Ammonia -N	< 0.100	5.300	0.464	45	0.906
Dissolved Organic Carbon	2.000	9.500	4.500	16	2.657
MBAS	< 0.010	< 0.010		6	
Total Coliform	< 10.000	250.000	81.429	7	91.911
Fecal Colifrom	< 10.000	40.000	8.571	7	15.736

TABLE 1.2-7

SUMMARY OF QUALITATIVE SPECTROGRAPHIC ANALYSIS
COMBINED ALLUVIAL AQUIFERS
Values in mg/l
MARCH 1975 through FEBRUARY 1977

Item	Low	High	Average	# Items Averaged	Std. Dev.
Aluminum	0.001	5.000	0.441	127	0.935
Antimony	---	---	---	0	---
Arsenic	---	---	---	0	---
Barium	0.001	0.050	0.008	54	0.013
Beryllium	0.001	0.001	0.001	5	0.000
Bismuth	---	---	---	0	---
Boron	0.010	0.500	0.361	127	0.176
Cadmium	---	---	---	0	---
Calcium	10.000	Major	10.000	6	0.000
Cerium	---	---	---	0	---
Cesium	0.001	0.001	0.001	1	0.000
Chromium	---	0.020	0.004	17	0.006
Cobalt	0.001	0.001	0.001	4	0.000
Columbium	---	---	---	0	---
Copper	0.001	0.050	0.013	126	0.014
Dysprosium	---	---	---	0	---
Erbium	---	---	---	0	---
Europium	---	---	---	0	---
Gadolinium	---	---	---	0	---
Gallium	0.001	0.010	0.004	6	0.005
Germanium	0.001	0.001	0.001	1	0.000
Gold	---	---	---	0	---
Hafnium	---	---	---	0	---
Holmium	---	---	---	0	---
Indium	---	---	---	0	---
Iridium	---	---	---	0	---
Iron	0.001	5.000	0.251	126	0.709
Lanthanum	---	---	---	0	---
Lead	0.001	0.500	0.030	54	0.076
Lithium	0.001	0.100	0.007	86	0.015
Lutetium	---	---	---	0	---
Mangesium	5.000	Major	2228.111	9	4405.680
Manganese	0.001	0.500	0.068	118	0.121
Mercury	---	---	---	0	---
Molybdenum	0.001	0.050	0.009	87	0.013
Neodymium	---	---	---	0	---
Nickel	0.001	0.070	0.011	7	0.026
Osmium	---	---	---	0	---
Palladium	---	---	---	0	---
Platinum	---	---	---	0	---
Potassium	0.010	2.000	0.519	126	0.507
Praseodymium	---	---	---	0	---
Radium	0.100	1.200	0.335	60	0.231
Rhenium	---	---	---	0	---
Rhodium	---	---	---	0	---
Rubidium	---	---	---	0	---
Ruthenium	---	---	---	0	---
Samarium	---	---	---	0	---
Scandium	---	---	---	0	---
Selenium	---	---	---	0	---
Silicon	2.000	Major	4.897	117	2.601
Silver	---	0.100	0.008	38	0.022
Sodium	1.000	Major	6.239	88	2.758
Strontium	0.010	0.100	0.105	116	0.085
Tantalum	---	---	---	0	---
Terbium	---	---	---	0	---
Thallium	---	---	---	0	---
Thorium	---	---	---	0	---
Thulium	---	---	---	0	---
Tin	0.001	0.001	0.001	15	0.000
Titanium	0.001	1.000	0.029	91	0.118
Tungsten	---	---	---	0	---
Uranium	0.005	0.008	0.006	2	0.002
Vanadium	0.001	0.020	0.007	10	0.008
Ytterbium	0.001	0.001	0.001	5	0.000
Yttrium	0.010	0.020	0.012	5	0.004
Zinc	0.001	0.020	0.005	44	0.006
Zirconium	0.010	0.010	0.010	2	0.000

--- Less than minimum detectable amount
Major - Concentration too large to quantify (see wet chemical analysis)

1.2.4 DEEP AQUIFER DRILLING PROGRAM

The Deep Aquifer Drilling Program has been previously described in RBOSP Progress Reports 2 and 4, Hydrologic Program. A summary of the drilling program is reported in RBOSP Progress Report 5.

1.2.5 DEEP AQUIFER COMPLETION PROGRAM

The Deep Aquifer Completion Program is reported in RBOSP Progress Reports 2 and 4, Hydrologic Program, Interpretive Text.

1.2.6 UPPER AND LOWER AQUIFER PUMPING TESTS

Pumping Test Data can be found in RBOSP Progress Report 3, Interpretive Text and Raw Data Section. Detailed interpretation is contained in RBOSP Progress Report 4, Interpretive Text, with basic data found in the associated Raw Data Volume.

1.2.7 DEEP AQUIFER MONITORING

The deep aquifer monitoring program started in December 1974. Progress Reports 2 through 9 have presented data gathered on the baseline deep aquifer monitoring program. Baseline data gathering was completed as of December 1976 on the deep aquifer monitor holes with the exception of deep aquifer hole G-S M-5 associated with 84 Mesa.

G-S M-5 is used to gather data in the uppermost aquifer system for the proposed 85 Mesa disposal site. Baseline data from the G-S M-5 hole were first collected in June 1975. RBOSP Progress Reports 4 through 10 have reported baseline data from G-S M-5. Baseline data collection for G-S M-5 was completed in May, 1977. This Progress Report will complete the reporting of baseline data for G-S M-5. Section 1.2.8, the Hydrologic Program Summary of this report, is a baseline summary of G-S M-5.

Table 1.2-8 is a collection schedule for G-S M-5, approved by the AOSS. As per RBOSP Approved Exploratory Plan, the monitoring of G-S M-5 consisted of measuring static water levels on a monthly basis, and water sampling of G-S M-5 on a semi-annual basis. Figure 1.2-9 is a hydrograph of water levels of G-S M-5 for Water Year 1975. Figure 1.2-10 is a location map of all the monitor holes associated with Tract C-a.

The latest water sample from G-S M-5 collected was in April of this reporting period. The laboratory analysis of the sample are reported in the Raw Data Section of this report.

A summary of the water quality data is presented in Table 1.2-9.

The water quality results from the April sampling shows an improvement in water quality. All major constituents, i.e. bicarbonate, carbonate, sulfide, show a reduction in quantity over all previous analysis. This improvement in water quality is probably the result of reduction in the impact of drilling on the water in hole G-S M-5.

TABLE 1.2-8

DATA COLLECTION SCHEDULE FOR G-S M-5

Monthly

Water Levels Measure

Semi Annually

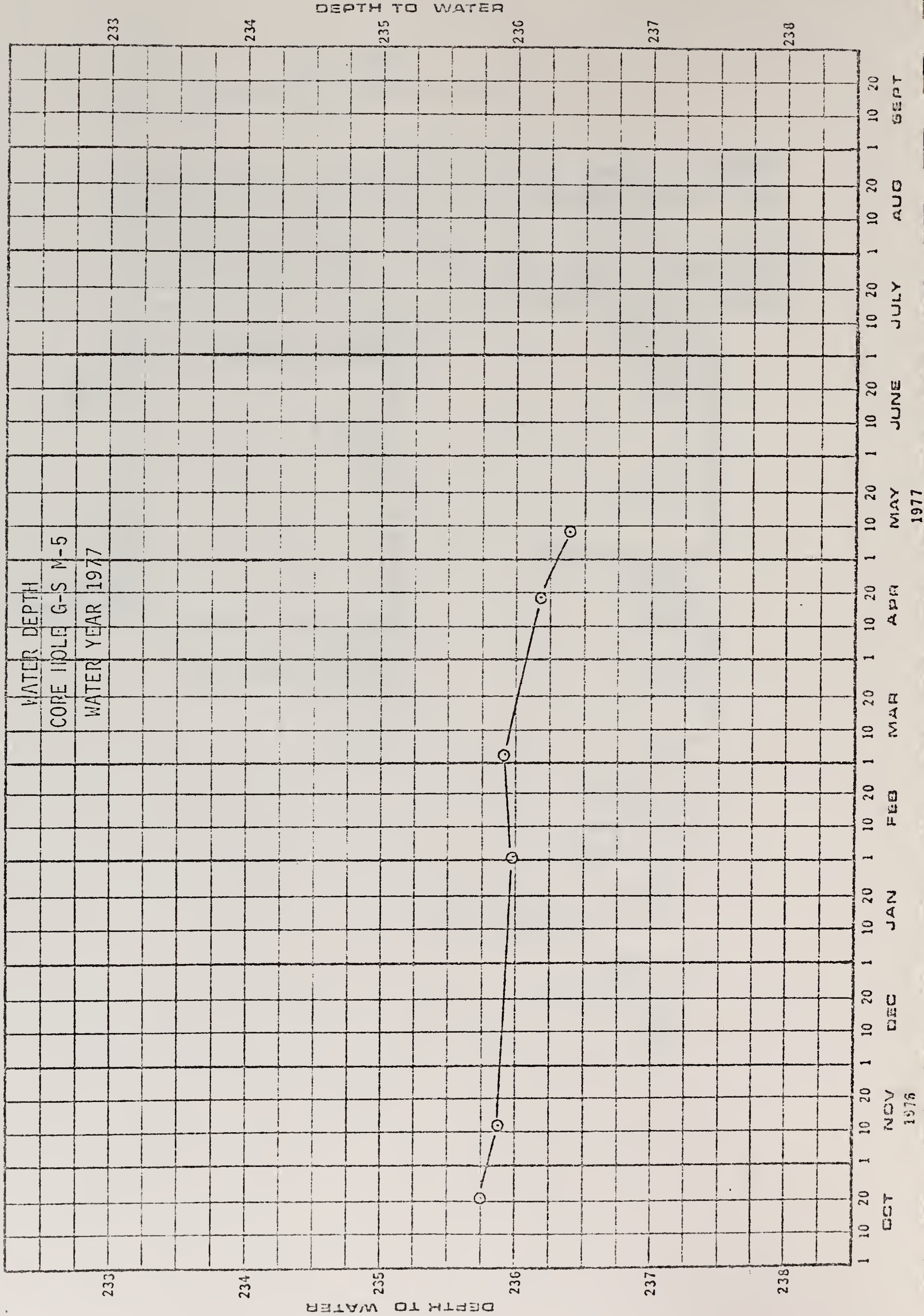
Water Sample Analyzed For:

- Alkalinity
- Aluminium
- Ammonia
- Arsenic
- Ba
- Be
- Bi
- Bicarbonate
- Br
- B
- Dissolved Organic Carbon
- Calcium
- Carbonate
- Cd
- Chloride
- Cr
- Cu
- Cyanide
- COD
- Dissolved Solids
- Ge
- Ga
- Fluoride
- Iron
- Lead
- Li
- Mg
- Mn
- Hg
- Mo
- Ni
- Nitrate plus Nitrite
- Phenols
- Dissolved Phosphate
- Potassium
- Se
- Silica
- Na
- Sr
- Sulfate
- Sulfide
- Ti
- V
- Zr
- Zn
- Color
- Odor
- pH
- Temperature
- Conductance

Radioactivity

Gross Alpha
 If >4 pci/l
  then
   RA 226,
   Natural Uranium

Gross Beta
 If >100 pci/l
  then
   SR^{90}
   Ce^{137}



WATER DEPTH
CORE HOLE G-S M-5
WATER YEAR 1977

FIGURE 1.2- 9

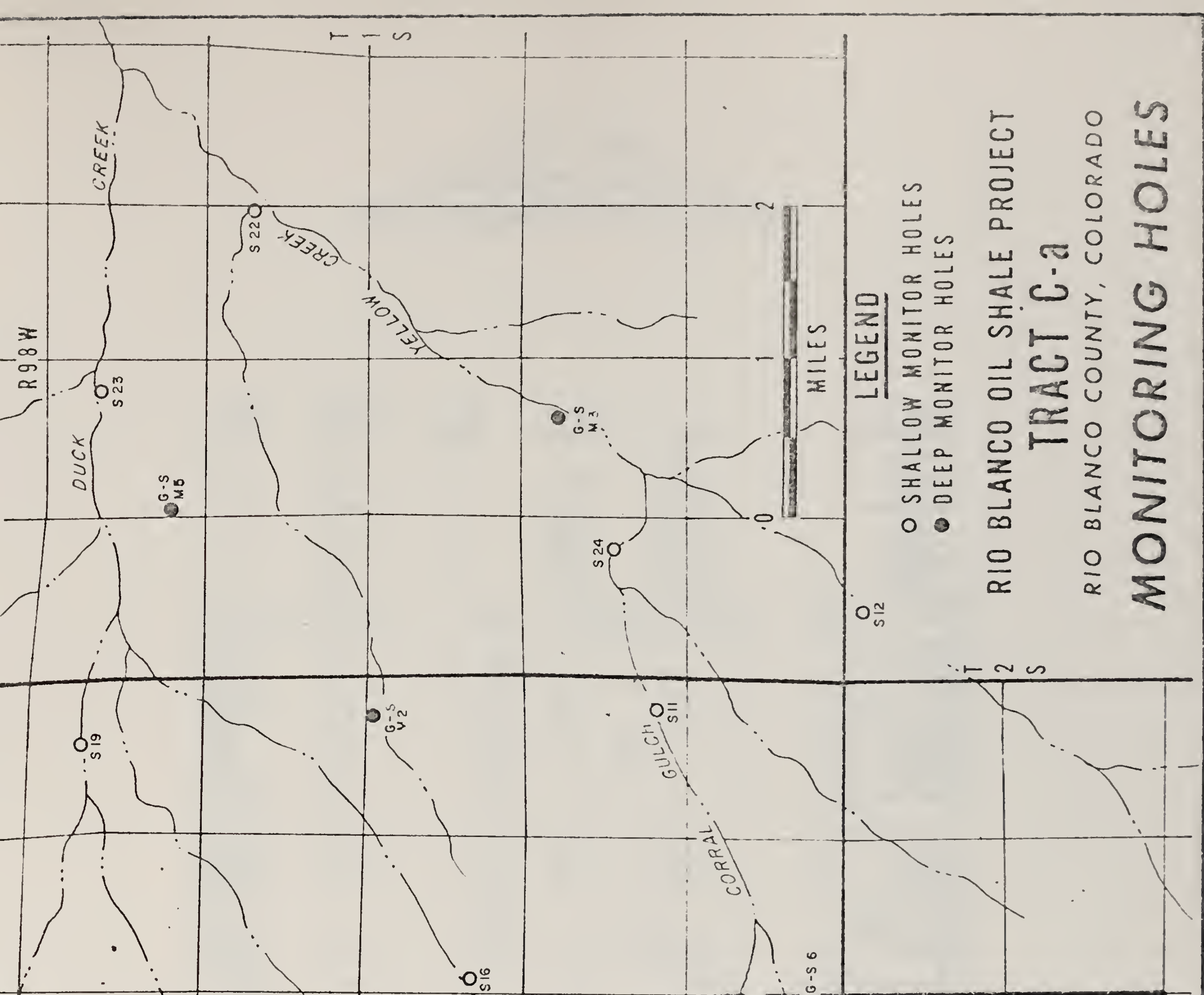

RIO BLANCO OIL SHALE PROJECT
TRACT C-a
RIO BLANCO COUNTY, COLORADO
MONITORING HOLES
LEGEND
○ SHALLOW MONITOR HOLES
● DEEP MONITOR HOLES
MILES
0
1
2
R98W
R99W
T 1 S
T 2 S
DUCK CREEK
YELLOW CREEK
CORRAL GULCH
S22
S23
G-S M5
G-S M3
S24
S12
S19
G-S V2
S11
S16
S17
S15
S18
G-S M4
G-S M1
TO3
D18
CE 702
G-S 6
S14
G-S 10
AM 4
G-S 15
G-S 4-5
G-S 14
TO1
D19
CE 705A
CE 709
G-S 13
AM 2A
G-S 9
G-S 12
S13
G-S 2-3
D16
G-S 11
G-S 8
AM 3
S8
CE 707
CE 701
TO2
D17
S6
CE 708
S7
G-S 7
G-S 1
CE 703

Figure 1.2-10

TABLE 1.2-9
WATER QUALITY SUMMARY
DEEP AQUIFER MONITOR HOLE G-S M-5

Method 3 Wet Analysis	Mean	Standard Deviation	No. of Samples	Maximum Value	Minimum Value
Aluminum	0.2		1	0.2	< 0.1
Ammonia	0.43	2.19	5	1.1	0.2
Arsenic	< 0.01	--	-	< 0.1	< 0.1
Bicarbonate	411.65	1.15	7	465.0	305
Cadmium	0.02	1.49	3	0.02	< 0.01
Calcium	30.29	1.35	7	42	18
Carbonate	37.29	1.58	3	60	< 0.1
Chloride	19.97	1.48	7	41	11
Chromium	< 0.01	--	-	< 0.01	< 0.01
Copper	0.52	2.59	4	1.7	< 0.01
Fluoride	0.26	1.42	7	0.5	0.2
Hydroxide			0	0	0
Iron	3.96	6.88	6	16.0	< 0.05
Lead	0.33	1.75	5	0.7	< 0.01
Magnesium	44.96	1.37	7	67	28
Mercury				< 0.2	< 0.1
Nitrate	0.48	4.29	6	5.5	0.2
Phosphate				< 0.1	< 0.1
Potassium	3.37	2.27	3	1.8	2.5
Selenium				< 0.1	< 0.1
Silicon Dioxide	7.73	1.70	7	13.0	2.5
Sodium	755.39	1.13	7	870	700
Sulfate	1431.11	1.18	7	1740	1100
Sulfide	0.62	4.91	2	1.9	< 1.0
Zinc	0.76	1.66	5	1.2	< 0.1
Gross Alpha					
Gross Beta					
Hardness	260.98	1.33	6	335	160
pH	6.96	1.06	7	7.8	6.6
Conductance	3252.24	1.15	7	4000	2550
Dissolved Solids	2614.69	1.11	7	2960	2170
Manganese	0.31	7.39	7	4.8	0.01
Alkalinity	351.21	1.08	7	380	300
Cyanide	0.02	--	1	< 0.01	< 0.01
Boron	0.35	2.30	7	1.2	0.10
Barium	0.24	1.33	2	0.3	< 1.0
Silver	0.02		1	0.02	< 0.01
Nickel	0.06	1.69	4	0.7	0.1
Lithium	0.14	1.63	2	0.2	0.1
D.O.C.	4.91	1.33	5	8	3
Nitrite				< 0.02	< 0.01
Bromide	0.24	1.33	2	0.3	< 0.1
C.O.D.	23.36	1.60	3	35.0	14.0
Phenols	0.004	--	1	0.004	< 0.001
Kjedahl Nitrogen					
Berryllium				< 0.01	< 0.01
Molybdenum				< 0.01	< 0.01
Strontium	5.7		1	5.7	< 0.01
Vanadium				< 0.01	< 0.01
Ortho Phosphate					
Ammonia	0.28	1.63	2	0.4	0.2
Dissolved Organic Carbon					
MBAS					
Total Coliform					
Fecal Coliform					
5-Day BOD					

TABLE 1.2-9
WATER QUALITY SUMMARY
DEEP AQUIFER MONITOR HOLE G-S M-5

Spectrographic Analysis	Mean	Standard Deviation	No. of Samples	Maximum Value	Minimum Value
Aluminum	0.06	11.42	6	2.0	0.005
Barium	0.010		1	0.010	0.010
Boron	0.13	4.55	6	0.5	0.010
Calcium	10		1	Major	10
Chromium	0.001		1	0.001	0.001
Copper	0.001	4.50	6	0.02	0.001
Iron	0.09	8.37	6	2.0	0.01
Lead	0.01	10.35	3	0.1	0.001
Lithium	0.00		2	0.01	0.001
Magnesium	5.0	1.00	2	Major	5.0
Manganese	0.02	7.94	6		
Nickel	0.001		1	0.001	0.001
Potassium	0.07	5.66	6	0.1	0.1
Radium	0.2		1	0.2	0.2
Silicon	5.41	1.81	6		
Silver	0.001		1	0.001	0.001
Sodium	4.73	1.94	4	Major	2
Strontium	0.15	5.66	6	0.1	0.01
Titanium	0	7.07	4	0.001	0.050
Vanadium	0.01		1	0.01	0.01
Ytterbium	0.001		1		
Yttrium	0.010				
Zinc	0.01	2.67	2	0.02	0.005

1.2.8 FINAL ENVIRONMENTAL BASELINE REPORT FOR 84 MESA

Information presented herein represents the summarization of two years of hydrologic baseline studies for the proposed spent shale disposal site on 84 Mesa. These studies were conducted concurrently with the baseline studies for Federal Oil Shale Tract C-a, which were reported in the "Final Environmental Baseline Report for Tract C-a and Vicinity," May 1977.

These hydrologic studies of 84 Mesa were made to assist in evaluating 84 Mesa for potential use of the area as a disposal site. The study tasks were defined to be:

- Locate and characterize surface water resources in the area.
- Locate and characterize the groundwater resources within the area.

The programs established to accomplish these tasks for 84 Mesa were hydrologic studies, precipitation, springs and seeps, other surface water resources, alluvial aquifers, and deep bedrock aquifers. Most of these studies were extentions of programs already performed for Tract C-a and vicinity.

1.2.8.1 Surface Water Hydrology

Surface hydrology baseline studies for 84 Mesa began in June 1975. The Tract C-a and surrounding area studies began in March 1974. The baseline studies for 84 Mesa were completed in May 1977. The surface hydrology studies were designed to define amount and distribution of rainfall, stream flow (both quality and quantity), and location of springs and seeps.

The semi-arid conditions of the area were a major consideration in study design.

1.2.8.1.1 Precipitation. Precipitation data were collected as part of the baseline studies of Tract C-a. These data were reported in "Final Environmental Baseline Report for Tract C-a and Vicinity" May 1977. Six rain gaging stations were operated by the U.S.G.S. in the vicinity.

1.2.8.1.2 Springs and Seeps. Springs and seeps were investigated in Tract C-a and vicinity. The results were reported in "Final Environmental Baseline Report for Tract C-a and Vicinity" May 1977.

Studies conducted to determine the type of water quality from springs and seeps in the vicinity of 84 Mesa has been reported on in Section II, Chapter 2, page II-36 of the above-mentioned report.

1.2.8.1.3 Streams. The 84 Mesa area has three streams which were investigated to measure flow: Corral Gulch on the south, Duck Creek on the North and a Tributary to Yellow Creek which disects the study area from west to east. Four stream gaging stations were installed to monitor flow. Table 1.2-10 lists, identifies and locates these stations. Figure 1.2-10 is a map which illustrates their location. A fifth station (Corral East of Tract C-a) also covers this area, however, baseline studies at this station have already been completed as part of the Tract C-a Environmental Baseline Studies and are reported in the "Final Environmental Baseline Report for Tract C-a and Vicinity" May 1977.

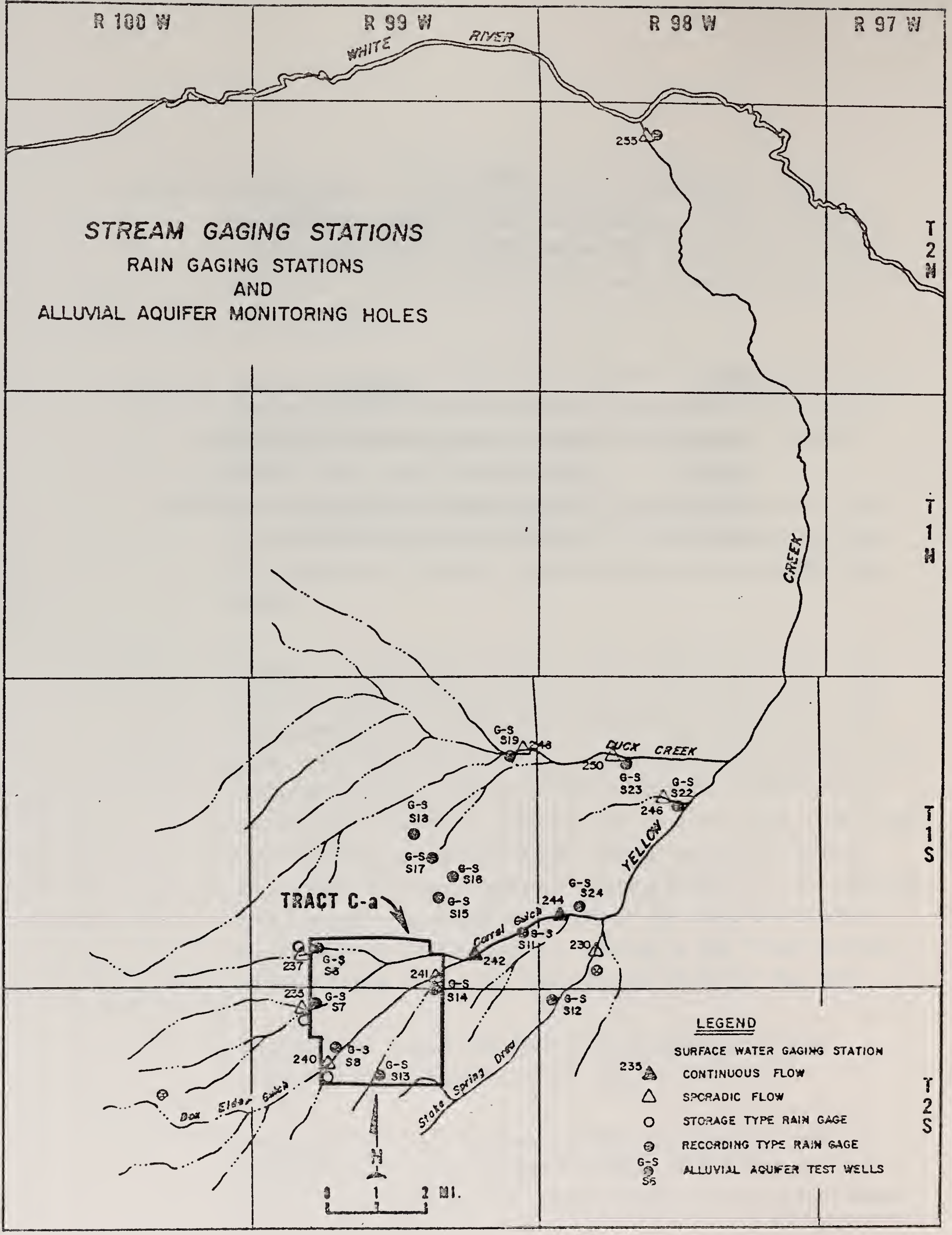
Monitoring of flow at the four U.S.G.S. operated 84 Mesa associated stream gaging stations began in May 1975.

Continuous flow data has been recorded since October 1975. Instantaneous data were collected from May 1975 to October 1975. Each station consists of a control weir built across the stream

TABLE 1.2-10

IDENTIFICATION NUMBER AND LOCATION OF THE 84 MESA USGS GAGING STATIONS

USGS ID NO.	LOCATION
09306248	Upper Big Duck Creek North of 84 Mesa
09306250	Lower Big Duck Creek north of 84 Mesa
09306246	Tributary to Yellow Creek east of 84 Mesa
09306244	Corral Gulch south of 84 Mesa



STREAM GAGING STATIONS
RAIN GAGING STATIONS
AND
ALLUVIAL AQUIFER MONITORING HOLES

FIGURE 1.2-11

for measuring discharge. In addition to the flow rate, temperature and conductivity are continuously monitored by automatic recording equipment. Table 1.2-11 is the data collection schedule used during the baseline data gathering period.

Table 1.2-12 is a surface gaging station flow summary for the baseline period. Also shown are the months during which a sample or samples were collected at each of the four gaging stations. Flow was recorded in very minute amounts during the month of March 1975. However, during this very brief interval of flow, i.e. a period of a few hours, a samples was not collected. It was learned through the recording instruments that there had been flow and were someone in the field at the time, a sample would have been collected.

Table 1.2-13 lists annual runoff in acre-feet at the four gaging stations. It shows that during the exceptionally dry year of 1977, flow did not occur during the snowmelt runoff period through either of the Big Duck Creek stations, or the Tributary to Yellow Creek gaging station. During a less dry year, 1976, flow occurred in these stations during February and March. Corral Gulch South of 84 Mesa was perennial from May 1974 through water year 1976.

A comparison was made between stream flow data for Corral Gulch south of 84 Mesa and Corral Gulch east of Tract C-a. These stations were found to have similar variations in flow. The data for these two stations as well as the other stations in the area indicate the major source of flow is a result of snowmelt. The snowmelt period is variable and has occurred from February through April. The perennial source of water is springs and seeps located above each station. Winter and spring flows

TABLE 1.2-11

DATA COLLECTION SCHEDULE FOR STREAM GAGING STATIONS

Continuously or Automatically

- Flow Rate
- Sediment Discharge
- Temperature
- Specific Conductance

Periodically

- Storage Rain Gages
- Recording Rain Gages
- Rainfall Intensity Gages

Monthly

Water Samples Analyzed For:

- Alkalinity
- Biological Oxygen Demand
- Dissolved Organic Carbon
- Boron
- Calcium
- Conductance
- Fluoride
- Magnesium
- Potassium
- Silica
- Sodium
- Sulfate
- Ammonia
- Bicarbonate
- Carbonate
- Chloride
- Color
- Dissolved Solids
- Kjeldahl Nitrogen
- Nitrate plus Nitrite
- Odor
- Dissolved Phosphate
- Turbidity
- Dissolved Oxygen
- pH
- Temperature
- Total Phosphate
- Ortho Phosphate
- Suspended Organic Carbon

Quarterly

Sample and Analyze:

- COD
- Fecal Coliform
- Total Coliform
- Bromide
- Cyanide
- MBAS
- Oil & Grease
- Phenols
- Sulfide
- Radioactivity
  - Gross Alpha
    - if > 4 pci/l
    - then Ra^{226},
    - Natural Uranium
  - Gross Beta
    - if >100 pci/l
    - then Sr^{90}
    - Ce^{137},
- Ba
- Be
- Ge
- Ga
- Ni
- Ti
- V
- Zr
- Al
- As
- Cd
- Cr
- Cu
- Fe
- Pb
- Li
- Mn
- Mo
- Hg
- Se
- Sr
- Zn

TABLE 1.2-12

SURFACE GAGING STATION FLOW AND SAMPLING SUMMARY

TRACT C-a

	Water Year 1975												October 1976 - May 1977							
Location	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Upper Big Duck Creek North of 84 Mesa					I S	I		I												
Lower Big Duck Creek North of 84 Mesa					I S	I														
Tributary to Yellow Creek East of 84 Mesa					I S	I														
Corral Gulch South of 84 Mesa	X S	X S	X S	X S	X S	X S	X	X S	X S	X S	X	X	X S	X	X	X	X S	X S	X S	I

X Flow recorded during entire month

I Intermittent flow recorded during month

S Sample collected during month

TABLE 1.2-13

ANNUAL RUNOFF IN ACRE-FEET FROM CONTINUOUS DATA

Station	Water Year 1975	10/76-5/77 Water Year 1976
Upper Big Duck Creek North of 84 Mesa	5.9	0
Lower Big Duck Creek North of 84 Mesa	18.9	0
Tributary to Yellow Creek East of 84 Mesa	35.5	0
Corral Gulch South of 84 Mesa	71.7	15.7

of water year 1977, at Corral Gulch at 84 Mesa reflected the unusually dry winter conditions which existed throughout the basin.

Baseline water quality analysis summaries for the four surface water monitoring stations associated with 84 Mesa are given on Tables 1.2-14 through 1.2-17 Grab samples were collected and analyzed by the U.S.G.S. on a regular preplanned schedule. These samples sould be considered as a random sample of all stream flows. Due to the lack of flow in Big Duck Creek stations and at the Tributary to Yellow Creek East of 84 Mesa, only one sample from each station was collected. From these analyses it is apparent that these samples represent snowmelt runoff. When compared to water quality analysis from the intermittent tributaries to Corral Gulch, i.e. Rinky Dink Gulch near East line Tract C-a, Stake Springs near Confluence with Corral Gulch which flowed in response to spring snowmelt ("Final Environmental Baseline Report for Tract C-a and Vicinity"), many similarities exist. These stations' water analyses are all lower in most dissolved constituents when compared to stations in the vicinity which receive some groundwater contribution.

The Lower Duck Creek station sample analyses show higher concentrations of most major constituents. This is as expected, and can be attributed to the longer travel time for water passing through the Lower Big Duck station and therefore the opportunity to increase concentrations of dissolved solids. This is similar to the reach of Corral Gulch within Tract C-a ("Final Environmental Baseline Report for Tract C-a and Vicinity").

Due to the similarity of many constituent concentrations along each of the intermittent reaches of three three 84 Mesa stations

TABLE 1-2.14

BASELINE SURFACE WATER QUALITY SUMMARY
CORRAL GULCH AT 84 MESA

Param. No.	Item	High	Low	Geometric Mean	Geometric Deviation	No. of Analyses
410	Alkalinity (mg/l)	523.00	425.00	497.23	1.06	14
1106	Aluminum (mg/l)	20.00	10.00	14.14	1.46	6
71846	Ammonia (NH_4) (mg/l)	0.19	0	0.10	4.71	14
1000	Arsenic (ug/l)	6.00	2.00	2.98	1.52	9
1005	Barium (ug/l)	200.00	100.00	118.92	1.41	4
1010	Beryllium (ug/l)	0	0	--	--	3
440	Bicarbonate (mg/l)	638.00	518.00	606.42	1.06	14
1015	Bismuth (ug/l)	0	0	--	--	3
310	BOD (mg/l)					
1020	Boron (ug/l)	220.00	40.00	159.98	1.52	14
71870	Bromide (mg/l)					
1025	Cadmium (ug/l)	1	0	0.50	--	6
915	Calcium (mg/l)	10.00	99.00	106.24	1.05	14
445	Carbonate (mg/l)	0	0	--	--	14
940	Chloride (mg/l)	21.00	15.00	18.21	1.10	14
1030	Chromium (ug/l)	10.00	0	3.67	--	4
340	COO (mg/l)	26.00	6.00	13.93	1.96	4
31615	Coliform, Fecal (Col/100 ml)	58.00	58.00	--	--	1
74050	Coliform, Total (Col/100 ml)					
80	Color (PCU)	25.00	0.00	7.37	2.27	
95	Conductivity, Spec. (umhos)	2000.00	1520.00	1779.42	1.07	14
1040	Copper (ug/l)	6.00	1.00	3.28		6
720	Cyanide (mg/l)	0.01	0	--	--	6
300	Dissolved Oxygen (mg/l)	13.4	5.10	9.90	1.32	11
950	Fluoride (mg/l)	0.40	0.30	0.32	1.14	14
1120	Gallium (ug/l)	0	0	--	--	3
1125	Germanium (ug/l)	0	0	--	--	3
900	Hardness (Ca, Mg) (mg/l)	730.00	650.00	701.65	1.04	14
1046	Iron (ug/l)	80.00	10.00	33.86	2.49	8
625	Kjeldahl Nitrogen (mg/l)	1.00	0.29	0.61	1.50	12
1049	Lead (ug/l)	0	0	--	--	5
1130	Lithium (ug/l)	20.00	5.00	11.89	1.41	6
925	Magnesium (mg/l)	110.00	97.00	105.22	1.05	14
1056	Manganese (ug/l)	220.00	60.00	101.37	1.74	4
38260	MBAS (mg/l)	2.00	0.10	1.41	1.63	2
71890	Mercury (ug/l)	0	0	--	--	6
1060	Molybdenum (ug/l)	60.00	40.00	53.05	1.21	4
1065	Nickel (ug/l)	0.	0	--	--	3
71851	Nitrate (NO_3) (mg/l)					
71856	Nitrite (NO_2) (mg/l)					
631	Nitrite Plus Nitrate (N)(mg/l)	0.85	0.02	0.25	3.00	12
608	Nitrogen, Ammonia (mg/l)	0.15	0	0.07	--	14
607	Nitrogen, Organic (mg/l)	0.98	0.28	0.57	1.49	12
1330	Odor (severity)					
550	Oil and Grease (mg/l)	7.00	0	1.40	--	5
	Organic Carbon (mg/l)					
681	Dissolved	39.00	6.7	11.48	1.56	12
689	Suspended	1.0	0.1	0.44	2.12	9
680	Total					
	Pesticides (ug/l)					
400	pH*	8.6	7.40	8.12	0.29	14
32730	Phenols (mg/l)					
	Phosphate (mg/l)					
660	Dissolved (PO_4)	2.6	0	0.17	4.22	14
671	Ortho (P)					
665	Total (P)					
935	Potassium (mg/l)	3.3	2.3	2.73	1.11	14
	Radioactivity					
	Gross Alpha (pc/l)#					
9511	Radium 226 (pc/l)	0.06	0.02	0.03	2.17	2
80030	Natural Uranium (ug/l)	22	0	7.33	--	3
	Gross Beta (pc/l)					
80050	SR^{90} (pc/l)	14.00	7.20	9.80	1.40	3
3515	CE^{137} (pc/l)					
1145	Selenium (ug/l)	2.00	1.00	1.14	1.36	6
955	Silica (SiO_2)	22.00	17.00	18.09	1.09	14
1075	Silver (ug/l)	0	0	--	--	3
930	Sodium (mg/l)	200.00	170.00	184.02	1.06	14
931	Sodium Adsorption Ratio	3.3	2.3	3.05	1.05	14
70301	Solids, Dissolved (mg/l)	1380.00	1170.00	1285.94	1.05	14
1080	Strontium (ug/l)	3000.00	2300.00	2692.83	1.08	7
945	Sulfate (mg/l)	590.00	480.00	547.94	1.07	14
746	Sulfide (mg/l)	0.6	0	0.28	--	4
10	Temperature (°C)*	23.0	6.0	10.57	6.05	14
1100	Tin (ug/l)	0	0	--	--	3
1150	Titanium (ug/l)	0	0	--	--	3
70	Turbidity (JTU)					
1085	Vanadium (ug/l)	0	0	--	--	3
1090	Zinc (ug/l)	40.00	10.00	14.14	1.49	4
1160	Zirconium (ug/l)	0	0	--	--	3

* Normal mean and standard deviation

TABLE 1.2-15
BASELINE SURFACE WATER QUALITY SUMMARY
TRIBUTARY TO YELLOW CREEK EAST OF 84 MESA

Param. No.	Item	High	Low	Geometric Mean	Geometric Deviation	No. of Analyses
410	Alkalinity (mg/l)	99.00	99.00			1
1106	Aluminum (mg/l)	30.00	30.00			1
71846	Ammonia (NH_4) (mg/l)	0.98	0.98			1
1000	Arsenic (ug/l)	1.00	1.00			1
1005	Barium (ug/l)					
1010	Beryllium (ug/l)					
440	Bicarbonate (mg/l)	121.00	121.00			1
1015	Bismuth (ug/l)					
310	BOD (mg/l)					
1020	Boron (ug/l)	110.00	110.00			1
71870	Bromide (mg/l)					
1025	Cadmium (ug/l)					
915	Calcium (mg/l)	18.00	18.00			1
445	Carbonate (mg/l)	0	0			1
940	Chloride (mg/l)	1.90	1.90			1
1030	Chromium (ug/l)					
340	COD (mg/l)					
31615	Coliform, Fecal (Col/100 ml)					
74050	Coliform, Total (Col/100 ml)					
80	Color (PCU)	450.00	450.00			1
95	Conductivity, Spec. (umhos)	100.00	100.00			1
1040	Copper (ug/l)					
720	Cyanide (mg/l)					
300	Dissolved Oxygen (mg/l)					
950	Fluoride (mg/l)	0.10	0.10			1
1120	Gallium (ug/l)					
1125	Germanium (ug/l)					
900	Hardness (Ca, Mg) (mg/l)	52.00	52.00			1
1046	Iron (ug/l)	230.00	230.00			
625	Kjeldahl Nitrogen (mg/l)	1.10	1.10			1
1049	Lead (ug/l)					
1130	Lithium (ug/l)					
925	Magnesium (mg/l)	1.70	1.70			1
1056	Manganese (ug/l)					
38260	MBAS (mg/l)					
71890	Mercury (ug/l)					
1060	Molybdenum (ug/l)					
1065	Nickel (ug/l)					
71851	Nitrate (NO_3) (mg/l)					
71856	Nitrite (NO_2) (mg/l)					
631	Nitrite Plus Nitrate (N)(mg/l)	0.34	0.34			1
608	Nitrogen, Ammonia (mg/l)	0.76	0.76			1
607	Nitrogen, Organic (mg/l)	0.34	0.34			1
1330	Odor (severity)	0	0			1
550	Oil and Grease (mg/l)					
	Organic Carbon (mg/l)					
681	Dissolved	76.00	76.00			1
689	Suspended	6.60	6.60			1
680	Total					
	Pesticides (ug/l)					
400	pH*	8.50	8.50			1
32730	Phenols (mg/l)					
	Phosphate (mg/l)					
660	Dissolved (PO_4)	8.60	8.60			1
671	Ortho (P)					
665	Total (P)					
935	Potassium (mg/l)	1.50	1.50			1
	Radioactivity					
	Gross Alpha (pc/l)#					
9511	Radium 226 (pc/l)					
80030	Natural Uranium (ug/l)					
	Gross Beta (pc/l)					
80050	SR^{90} (pc/l)					
3515	CE^{137} (pc/l)					
1145	Selenium (ug/l)					
955	Silica (SiO_2)	5.60	5.60			1
1075	Silver (ug/l)					
930	Sodium (mg/l)	7.30	7.30			1
931	Sodium Adsorption Ratio	0.40	0.40			1
70301	Solids, Dissolved (mg/l)	104.00	104.00			1
1080	Strontium (ug/l)	180.00	180.00			1
945	Sulfate (mg/l)	5.10	5.10			1
746	Sulfide (mg/l)					
10	Temperature (°C)*	0.50	0.50			1
1100	Tin (ug/l)					
1150	Titanium (ug/l)					
70	Turbidity (JTU)					
1085	Vanadium (ug/l)					
1090	Zinc (ug/l)					
1160	Zirconium (ug/l)					

* Normal mean and standard deviation

TABLE 1.2-16

BASELINE SURFACE WATER QUALITY SUMMARY
BIG DUCK CREEK NORTH OF 84 MESA

Param. No.	Item	High	Low	Geometric Mean	Geometric Deviation	No. of Analyses
410	Alkalinity (mg/l)	107.00	107.00			1
1106	Aluminum (ug/l)	230.00	230.00			1
71846	Ammonia (NH_4) (mg/l)	0.84	0.84			1
1000	Arsenic (ug/l)	4.00	4.00			1
1005	Barium (ug/l)					
1010	Beryllium (ug/l)					
440	Bicarbonate (mg/l)	131.00	131.00			1
1015	Bismuth (ug/l)					
310	BOO (mg/l)					
1020	Boron (ug/l)	170.00	170.00			1
71870	Bromide (mg/l)					
1025	Cadmium (ug/l)					
915	Calcium (mg/l)	20.00	20.00			1
445	Carbonate (mg/l)	0	0			1
940	Chloride (mg/l)	4.80	4.80			1
1030	Chromium (ug/l)					
340	COO (mg/l)					
31615	Coliform, Fecal (Col/100 ml)					
74050	Coliform, Total (Col/100 ml)					
80	Color (PCU)	180.00	180.00			1
95	Conductivity, Spec. (umhos)	220.00	220.00			1
1040	Copper (ug/l)					
720	Cyanide (mg/l)					
300	Oissolved Oxygen (mg/l)					
950	Fluoride (mg/l)	0.10	0.10			1
1120	Gallium (ug/l)					
1125	Germanium (ug/l)					
900	Hardness (Ca, Mg) (mg/l)	73.00	73.00			1
1046	Iron (ug/l)	170.00	170.00			1
625	Kjeldahl Nitrogen (mg/l)	3.80	3.80			1
1049	Lead (ug/l)					
1130	Lithium (ug/l)					
925	Magnesium (mg/l)	5.60	5.60			1
1056	Manganese (ug/l)					
38260	MBAS (mg/l)					
71890	Mercury (ug/l)					
1060	Molybdenum (ug/l)					
1065	Nickel (ug/l)					
71851	Nitrate (NO_3) (mg/l)					
71856	Nitrite (NO_2) (mg/l)					
631	Nitrite Plus Nitrate (N)(mg/l)	0.45	0.45			1
608	Nitrogen, Ammonia (mg/l)	0.65	0.65			1
607	Nitrogen, Organic (mg/l)	3.2	3.2			1
1330	Odor (severity)					
550	Oil and Grease (mg/l)					
	Organic Carbon (mg/l)					
681	Dissolved					
689	Suspended					
680	Total					
	Pesticides (ug/l)					
400	pH*	8.30	8.30			1
32730	Phenols (mg/l)					
	Phosphate (mg/l)					
660	Oissolved (PO_4)	2.50	2.50			1
671	Ortho (P)					
665	Total (P)					
935	Potassium (mg/l)	15.00	15.00			1
	Radioactivity					
	Gross Alpha (pc/l)#					
9511	Radium 226 (pc/l)					
80030	Natural Uranium (ug/l)					
	Gross Beta (pc/l)					
80050	SR^{90} (pc/l)					
3515	CE^{137} (pc/l)					
1145	Selenium (ug/l)					
955	Silica (SiO_2)	5.20	5.20			1
1075	Silver (ug/l)					
930	Sodium (mg/l)	18.00	18.00			1
931	Sodium Adsorption Ratio	0.90	0.90			1
70301	Solids, Dissolved (mg/l)	149.00	149.00			1
1080	Strontium (ug/l)	220.00	220.00			1
945	Sulfate (mg/l)	12.00	12.00			1
746	Sulfide (mg/l)					
10	Temperature (°C)*	0.50	0.50			1
1100	Tin (ug/l)					
1150	Titanium (ug/l)					
70	Turbidity (JTU)					
1085	Vanadium (ug/l)					
1090	Zinc (ug/l)					
1160	Zirconium (ug/l)					

* Normal mean and standard deviation

TABLE 1.2-17

BASELINE SURFACE WATER QUALITY SUMMARY
LOWER BIG DUCK CREEK NORTH OF 84 MESA

Param. No.	Item	High	Low	Geometric Mean	Geometric Deviation	No. of Analyses
410	Alkalinity (mg/l)	135.00	135.00			1
1106	Aluminum (mg/l)	200.00	200.00			1
71846	Ammonia (NH_4) (mg/l)	0.44	0.44			1
1000	Arsenic (ug/l)	2.00	2.00			1
1005	Barium (ug/l)	100.00	100.00			1
1010	Beryllium (ug/l)					
440	Bicarbonate (mg/l)	164.00	164.00			1
1015	Bismuth (ug/l)					
310	BOD (mg/l)					
1020	Boron (ug/l)	130.00	130.00			1
71870	Bromide (mg/l)					
1025	Cadmium (ug/l)	1.00	1.00			1
915	Calcium (mg/l)	22.00	22.00			1
445	Carbonate (mg/l)	0	0			1
940	Chloride (mg/l)	4.20	4.20			1
1030	Chromium (ug/l)	0	0			1
340	COD (mg/l)	87.00	87.00			1
31615	Coliform, Fecal (Col/100 ml)					
74050	Coliform, Total (Col/100 ml)					
80	Color (PCU)	180.00	180.00			1
95	Conductivity, Spec. (umhos)	320.00	320.00			1
1040	Copper (ug/l)					
720	Cyanide (mg/l)	0	0			1
300	Dissolved Oxygen (mg/l)					
950	Fluoride (mg/l)	0.10	0.10			1
1120	Gallium (ug/l)					
1125	Germanium (ug/l)					
900	Hardness (Ca, Mg) (mg/l)	78.00	78.00			1
1046	Iron (ug/l)	340.00	340.00			1
625	Kjeldahl Nitrogen (mg/l)	3.10	3.10			1
1049	Lead (ug/l)					
1130	Lithium (ug/l)					
925	Magnesium (mg/l)	5.60	5.60			1
1056	Manganese (ug/l)					
38260	MBAS (mg/l)	0	0			1
71890	Mercury (ug/l)					
1060	Molybdenum (ug/l)					
1065	Nickel (ug/l)					
71851	Nitrate (NO_3) (mg/l)					
71856	Nitrite (NO_2) (mg/l)					
631	Nitrite Plus Nitrate (N)(mg/l)	0.52	0.52			1
608	Nitrogen, Ammonia (mg/l)	0.34	0.34			1
607	Nitrogen, Organic (mg/l)	2.80	2.80			1
1330	Odor (severity)					
550	Oil and Grease (mg/l)					
	Organic Carbon (mg/l)					
681	Dissolved					
689	Suspended					
680	Total					
	Pesticides (ug/l)					
400	pH*	8.70	8.70			1
32730	Phenols (mg/l)					
	Phosphate (mg/l)					
660	Dissolved (PO_4)	1.50	1.50			1
671	Ortho (P)					
665	Total (P)					
935	Potassium (mg/l)	13.00	13.00			1
	Radioactivity					
	Gross Alpha (pc/l)#					
9511	Radium 226 (pc/l)					
80030	Natural Uranium (ug/l)					
	Gross Beta (pc/l)					
80050	SR^{90} (pc/l)					
3515	CE^{137} (pc/l)					
1145	Selenium (ug/l)					
955	Silica (SiO_2)	5.80	5.80			1
1075	Silver (ug/l)					
930	Sodium (mg/l)	25.00	25.00			1
931	Sodium Adsorption Ratio	1.20	1.20			1
70301	Solids, Dissolved (mg/l)	172.00	172.00			1
1080	Strontium (ug/l)	260.00	260.00			1
945	Sulfate (mg/l)	11.00	11.00			1
746	Sulfide (mg/l)					
10	Temperature (°C)*	0.5	0.5			1
1100	Tin (ug/l)					
1150	Titanium (ug/l)					
70	Turbidity (JTU)					
1085	Vanadium (ug/l)					
1090	Zinc (ug/l)					
1160	Zirconium (ug/l)					

* Normal mean and standard deviation

with those intermittent reaches having U.S.G.S. sampling stations on or near Tract C-a, it can be expected that many of the patterns of concentration of major constituents will be the same as reported in the "Final Baseline Report for Tract C-a and Vicinity."

Corral Gulch at 84 Mesa gaging station samples show many similar proportional constituent relationships with those of Corral Gulch East of Tract C-a ("Final Environmantal Baseline Report for Tract C-a and Vicinity"). In general, Corral Gulch at 84 Mesa has slightly higher concentrations of most major constituents than the immediate station up reach, Corral Gulch East of Tract C-a.

Due to the similarities of many chemical constituents from samples at Corral Gulch 84 Mesa with Corral Gulch East of Tract C-a samples correlation patterns between constituents might be expected to follow relationships at Corral East of Tract C-a ("Final Environmental Baseline Report for Tract C-a and Vicinity").

Table 1.2-18 compares the water quality limits on various constituents for range animals with the waters found at the four 84 Mesa gaging stations. For those constituents' concentrations that were determined, more exceeded limits.

Table 1.2-19 compares the water quality limits on various constituents for drinking water standards. Those drainages which have intermittend flow due to snowmelt runoff did not have water constituents' concentrations which exceed limits. An exception is one iron concentration value in Lower Big Duck Creek which exceeds the suggested limit by 23 percent. Corral Gulch at 84 Mesa samples consistently had values of manganese, sodium

TABLE 1.2-18
WATER QUALITY LIMITS
RANGE ANIMALS AND SURFACE WATER

		Percent of Samples Limit Exceeded			
	Limits[1]	Corral Gulch 84 Mesa	Upper Big Duck	Lower Big Duck	Tributary to Yellow Creek
Arsenic (mg/l)	0.15	0	0	0	0
Cadmium (mg/l)	0.01	0	--	0	--
Chormium (mg/l)	0.05	0	--	0	--
Fluoride (mg/l)	2.00	0	0	0	0
Lead (mg/l)	0.05	0	--	--	0
Selenium (mg/l)	0.01	0	--	--	--
TDS (mg/l)	10,000	0	0	0	0
Radium_{226} (pc/l)	3	--	--	--	--
Strontium_{90} (pc/l)	10	0	0	0	0

-- Insufficient Data

1 McKee & Wolf; 1963, Todd, 1959,

TABLE 1.2-19

DRINKING WATER QUALITY LIMITS
COMPARED WITH
SURFACE WATER QUALITY AT MONITORING SITES

	Percent of Samples Limit Exceeded				
	USPHS Limits	Corral Gulch 84 Mesa	Upper Big Duck	Lower Big Duck	Tributary to Yellow Creek
Arsenic (mg/l)	0.05	0	0	0	0
Barium (mg/l)	1.00	0	--	0	--
Cadmium (mg/l)	0.01	0	--	0	--
Chloride (mg/l)	250.00	0	0	0	0
Chromium (mg/l)	0.05	0	--	0	--
Copper (mg/l)	1.00	0	--	--	0
Cyanide (mg/l)	0.20	0	--	0	--
Fluoride (mg/l)	2.40	0	0	0	0
Iron (mg/l)	0.30	0	0	100	0
Lead (mg/l)	0.05	0	--	--	--
Manganese (mg/l)	0.05	100	--	--	--
Nitrate (mg/l)	45.00	0	--	--	0
Selenium (mg/l)	0.01	0	--	--	--
Silver (mg/l)	0.05	0	--	0	--
Sodium (mg/l)	115.00	100	0	0	0
Sulfate (mg/l)	250.00	100	0	0	0
TDS	500.00	100	0	0	0
Zinc	5.00	0	0	0	0
Radium$_{226}$ (pc/l)	3.00	--	--	--	--
Strontium$_{90}$ (pc/l)	10.00	--	--	--	--
Hardness (mg/l)	500.00	100	0	0	0

-- Insufficient Data

sulfate, TDS, and hardness which exceeded USPHS limits. Those constituents which exceed limits do so from 60 to 100 percent. This water would be considered only marginally potable.

Drainages within the Piceance Creek basin have not been classified by the Colorado Water Quality Control Commission. The White River has been classified. The White River and tributaries from its source near Trapper's Lake to the mouth of Piceance Creek is quality Class B_1. The mainstem of White River from the mouth of Piceance Creek to the Colorado-Utah State Line is quality Class B_2. Waters designated Class B_1 and B_2 are waters suitable or that may become suitable for all purposes for which raw water is customarily used, except primary contact recreation such as swimming and water skiing.

Automatic sediment samplers were installed at each station to collect data on sediment concentrations in stream flow. In times of relatively steady stream flows, samplers are programmed to take samples at regular intervals. During times of rapid changing stream flows, the samplers are programmed to collect samples every few minutes during a storm event. The sediment data itself has not been processed at this time by USGS. These data will be submitted at a later date.

1.2.8.2 Groundwater Hydrology

Three types of aquifers (alluvial, perched and deep bedrock) have been located in the Piceance Creek Basin. Only two (alluvial and deep bedrock) were located in the area of Tract C-a, while all three types were located in the study area of 84 Mesa.

Techniques used to locate 84 Mesa alluvial aquifers were the same as for Tract C-a. The alluvium was ampped by aerial photographs and a test drilling program was initiated to find the saturated zones.

The perched aquifer water zone was located by the drilling of the deep aquifer test hole G-S M-5. The hole was then completed to monitor this water zone.

Monitoring studies were made of the alluvial aquifers and the perched water zone to determine the characteristics of the aquifers. The upper and lower deep aquifers were not monitored. The monitoring program for Tract C-a of the deep aquifers sufficiently covered these waters.

Two deep bedrock aquifers were previously known to exist in the Piceance Creek Basin studies of these two deep bedrock aquifers for the 84 Mesa Baseline study was already being accomplished by the Tract C-a baseline study. As a result, no additional programs were added to evaluate the two deep bedrock aquifers.

1.2.8.2.1 ALLUVIAL AQUIFERS

Alluvium occurrences were mapped from aerial photographs in the vicinity of the 84 Mesa. In order to determine the depth, thickness, and water saturation of the alluvium, in the vicinity of 84 Mesa, a test drilling program was initiated in June 1975. The holes which contain water are being used as monitor holes.

A total of eight alluvial aquifer monitor holes, as shown on Figure 1.2-12 have been completed, all drilled to bedrock. Of these eight, no water was encountered in four and they have remained dry throughout the monitroing period. The remaining four have had measurable water levels since the initial construction.

Table 1.2-20is a summary of data of the alluvial monitor holes on 84 Mesa, along Corral Gulch and Duck Creek. Water levels, pH, temperature, and conductivity were measured in the field each month.

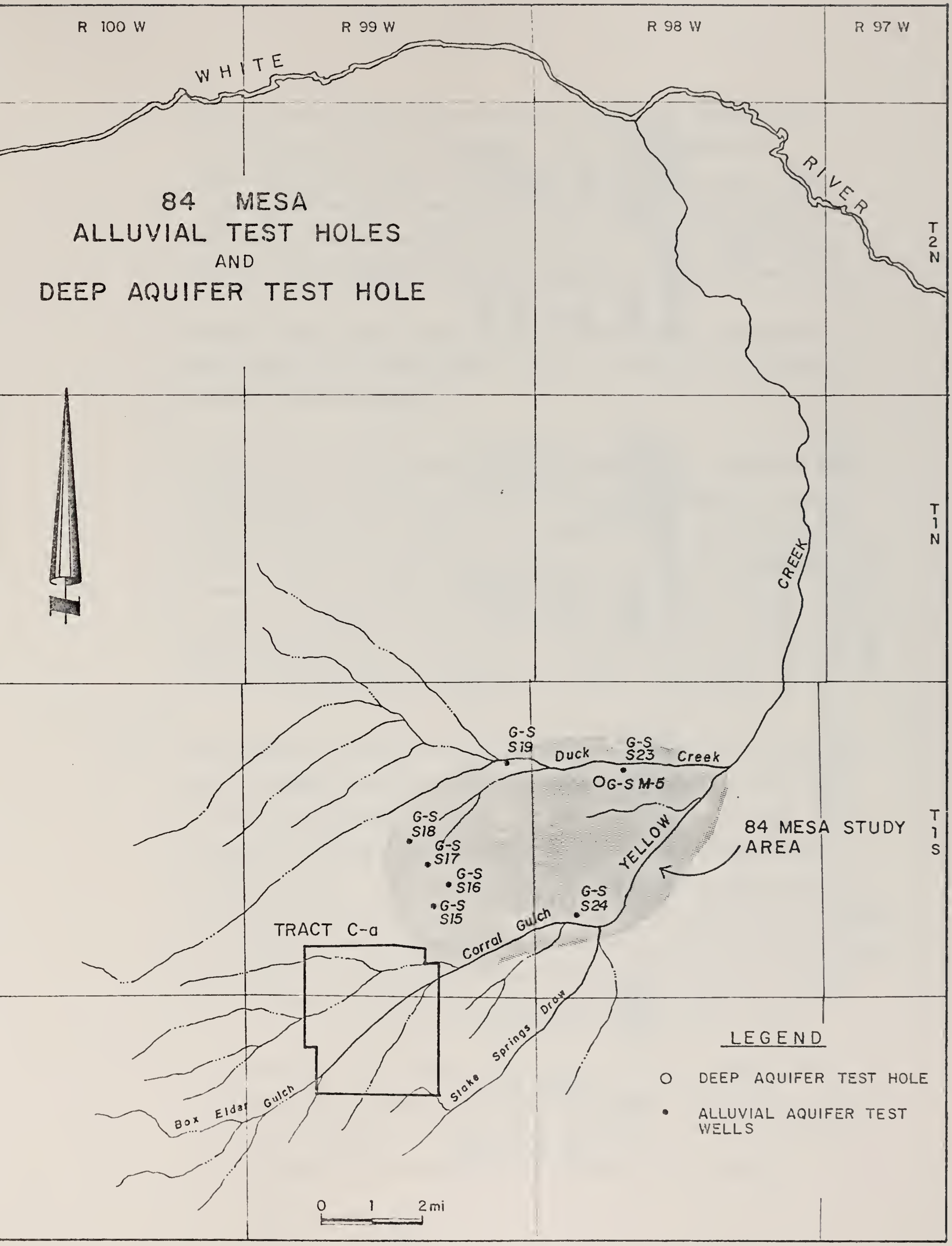

84 MESA
ALLUVIAL TEST HOLES
AND
DEEP AQUIFER TEST HOLE
R 100 W
R 99 W
R 98 W
R 97 W
T 2 N
T 1 N
T 1 S
WHITE RIVER
YELLOW CREEK
Duck Creek
Corral Gulch
Box Elder Gulch
Stake Springs Draw
TRACT C-a
84 MESA STUDY AREA
G-S S19
G-S S23
G-S M-5
G-S S18
G-S S17
G-S S16
G-S S15
G-S S24
0 1 2 mi
LEGEND
○ DEEP AQUIFER TEST HOLE
• ALLUVIAL AQUIFER TEST WELLS

FIGURE 1.2-12

TABLE 1.2-20

SUMMARY OF ALLUVIAL MONITORING HOLES

PHYSICAL DATA

Hole	Depth (feet)	Static Water Level		Temperature (^{O}F)		Conductivity (umhos)	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard* Deviation
G-S S-19	60	84.29	54.29	50.74	2.72	1621.48	11.67
G-S S-22	81	65.91	1.72	49.29	2.68	177.29	42.75
G-S S-23	83.5	29.78	6.82	49.30	2.58	1789.85	12.79
G-S S-24	75	1.90	0.74	45.88	8.99	1625.37	17.33

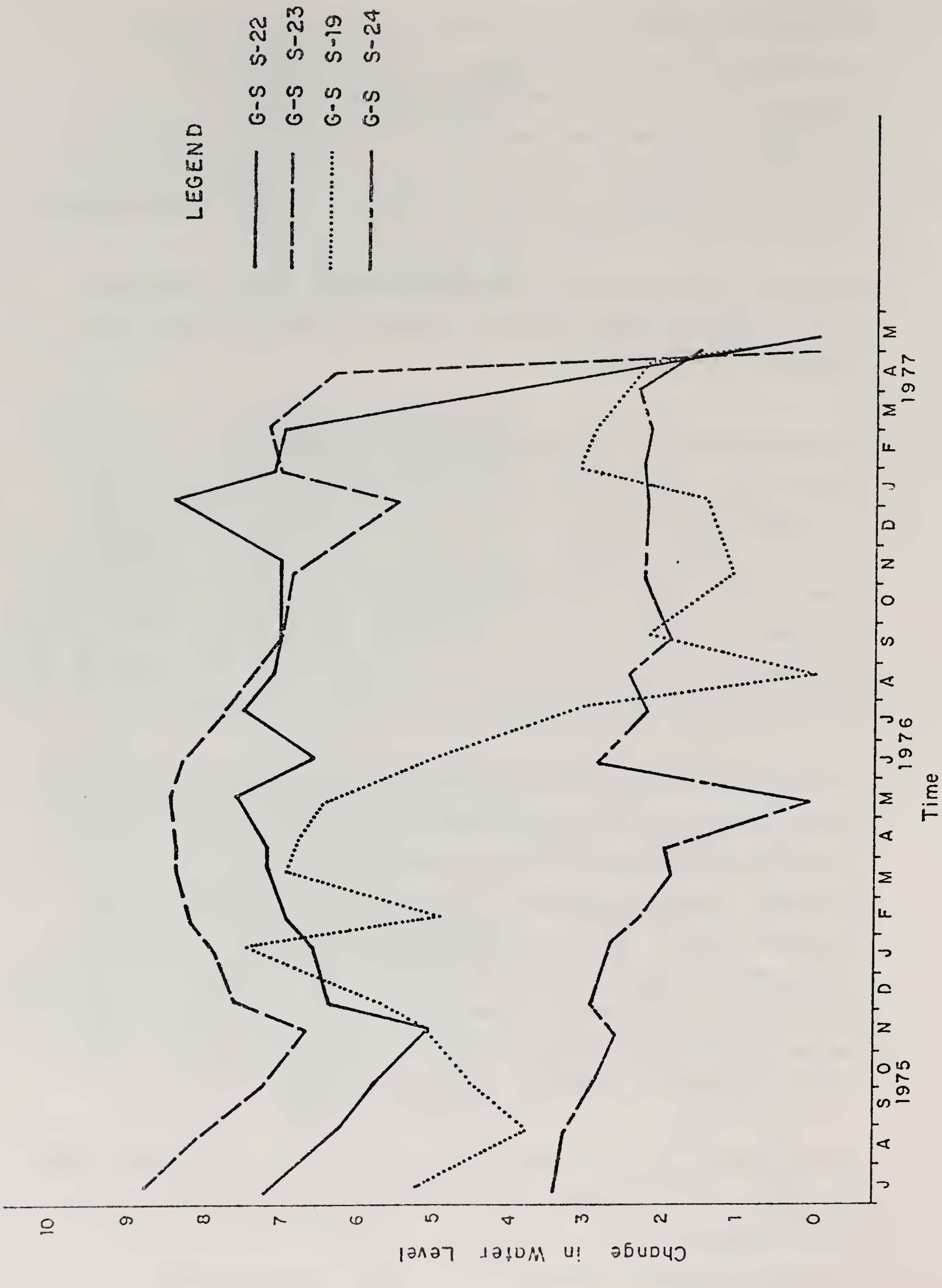
The alluvial aquifers occur along major stream valleys and are quite variable in thickness. The alluvial aquifers associated with 84 Mesa are present along Corral Gulch, the Tributary to Yellow Creek and Big Duck Creek. Water samples were not collected during drilling due to either insufficient water or high contamination as a result of that drilling process.

Alluvial monitoring holes associated with 84 Mesa containing water generally showed similar levels as Tract C-a associated alluvial montior holes.

The majority of the alluvial monitor holes which contained water showed water level rises through the months of March to June. The magnitude of the rise varied depending upon the drainage system in which the hole was located. During the remaining summer, fall, and winter months, water levels generally declined as shown in Figure 1.2-13. The final spring during which baseline data were collected from 84 Mesa illustrates the weak recharge of the alluvial aquifer due to an unusually dry winter.

The results of the alluvial monitoring program indicate that the major drainage systems have water saturated alluvium, and that, in many of the minor drainage systems the alluvium is dry. In the major drainage systems the data indicate a seasonal trend in water levels. This trend shows rising water levels during the snowmelt runoff period and declining water levels the remainder of the year. The limited observations to date from the continuous water level records indicate that the alluvial aquifers respond only indirectly to regional and local precipitation events.

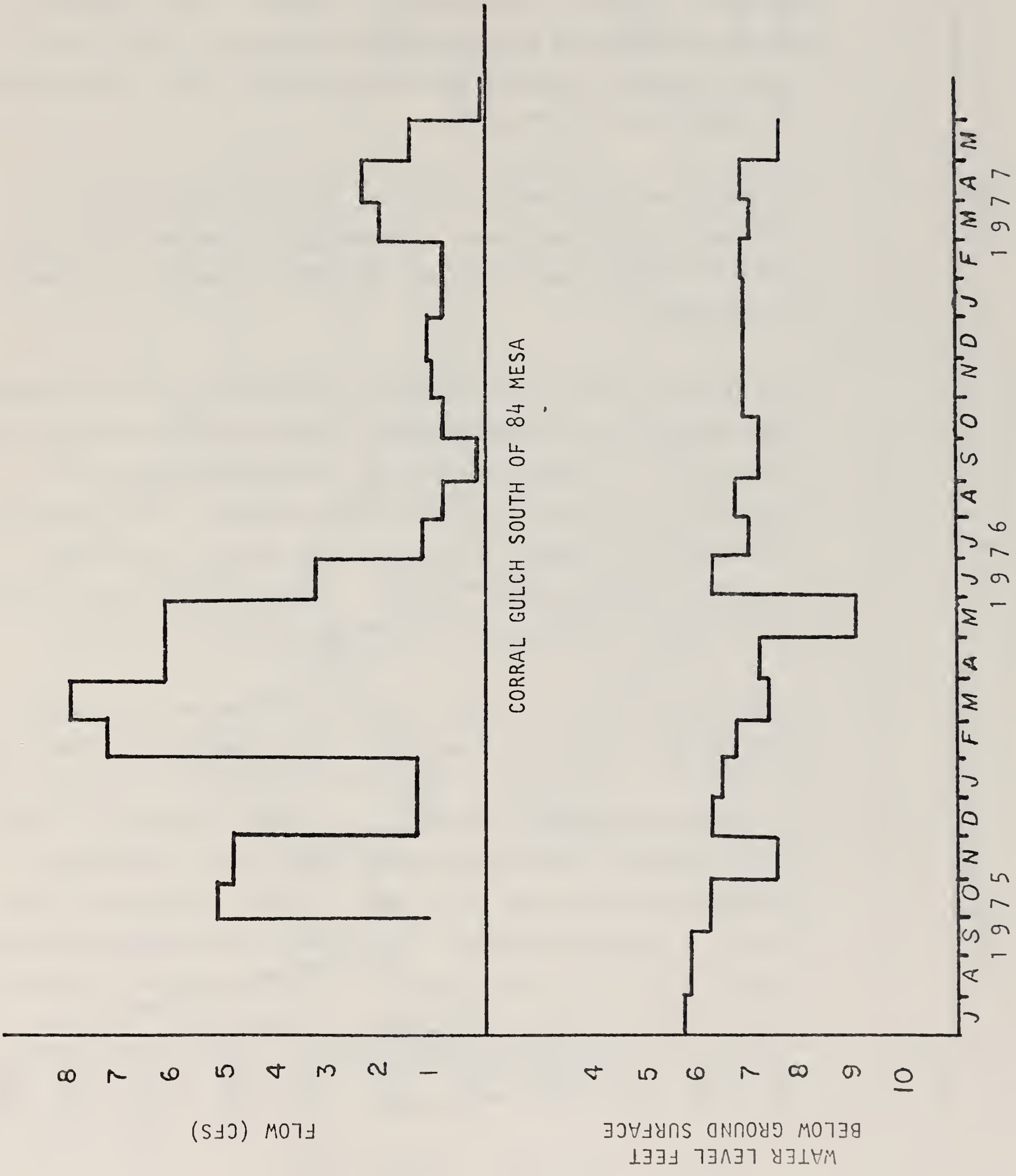
A histogram of water level data, Figure 1.2-13 , shows that there is no apparent relationship between the water level in G-S S-24 and stream flow near the location. Saturation of the alluvium at this location is suspected to be from spring snowmelt.



Alluvial Test holes

Change In Water Levels

Figure 1.2-13



ALLUVIAL AQUIFER G-S S-24 WATER LEVEL
VS.
STREAM FLOW, CORRAL GULCH SOUTH OF 84 MESA

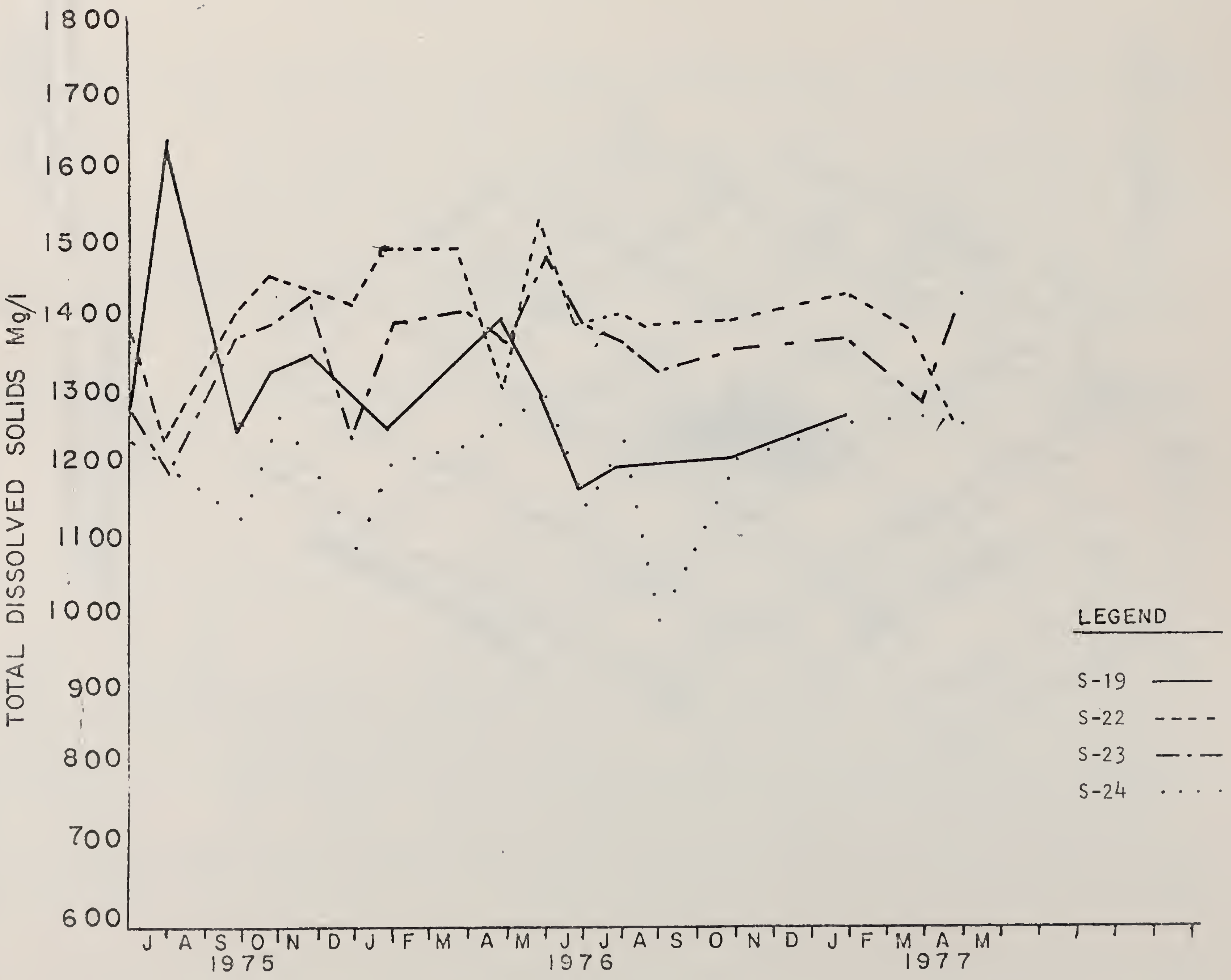
FIGURE 1.2-14

Surface flow in areas of alluvial aquifer monitor holes G-S S-19, G-S S-22 and G-S S-24 is isolated. No correlation can be made between surface flows and changes in water level. Spring snowmelt provides the primary water source for recharge of the alluvium in the area.

Alluvial monitor hole G-S S-19 is located in the mouth of a Tributary to Yellow Creek. An analysis of surface flow suggests that the primary drainage for this tributary is through the alluvium.

The alluvial holes are in hydraulic connection with the streams that occupy their valleys and this show seasonal variation. Figure 1.2-15 is a composite plot of TDS concentrations as a function of time for S-19, S-22, S-23 and S-24. As in the case of the alluvial aquifer from Tract C-a, there is no simple seasonal variation present in TDS. Hole S-19 did show a decrease in TDS level from the beginning of the monitoring period.

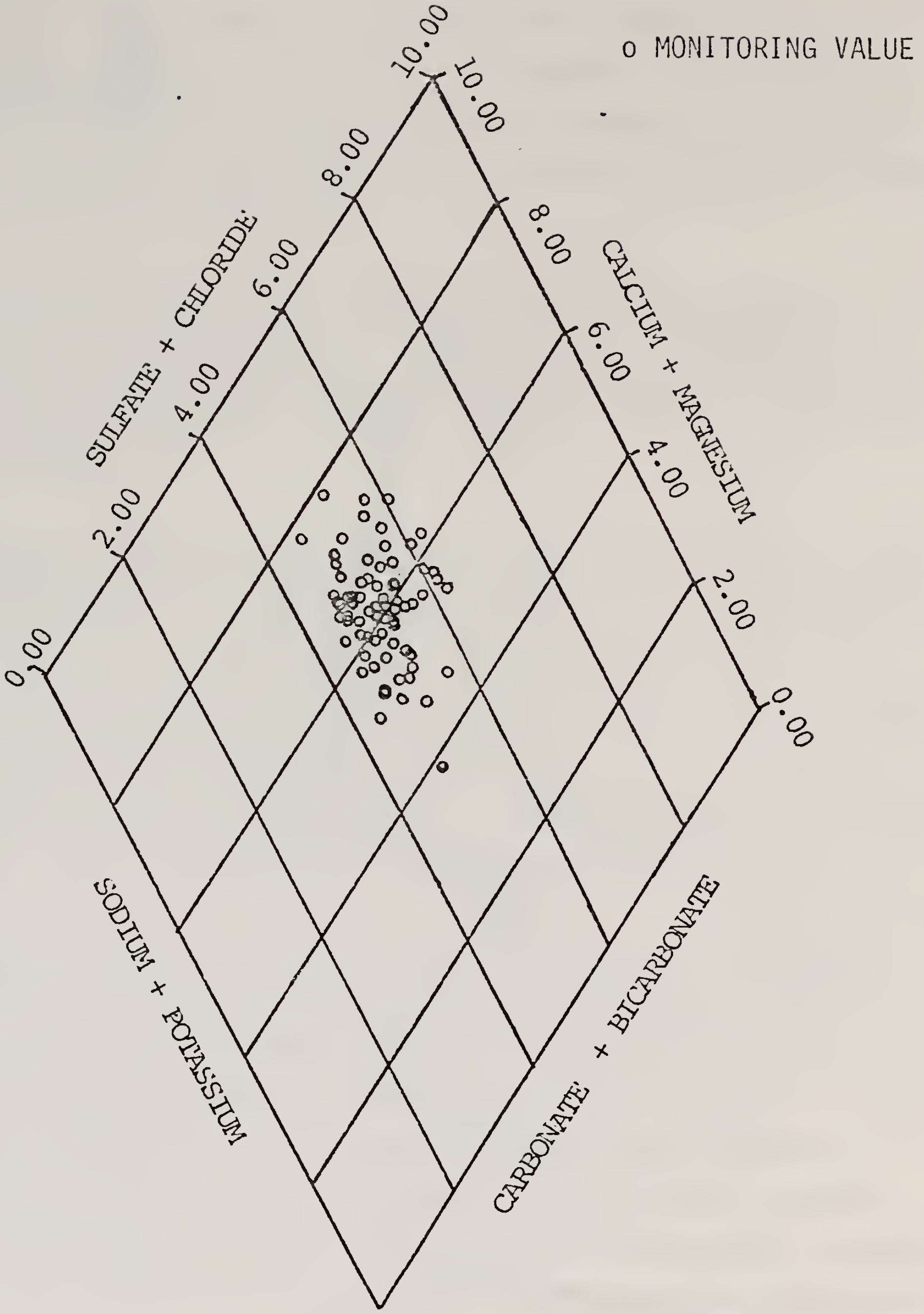
Figure 1.2-16 is a trilinear plot of all monitoring program analyses for the alluvial aquifers associated with 84 Mesa. Figure 1.2-17 is a trilinear plot of all of analyses for the alluvial monitoring program for the Tract C-a alluvial aquifers. A comparison between these two diagrams shows litter difference between the water types of 84 Mesa alluvial aquifers and the Tract C-a alluvial aquifers. The "Final Environmental Baseline Report for Tract C-a and Vicinity" presents detailed analysis of these alluvial aquifer water types. Tables 1.2-21 through 1.2-24 are baseline groundwater quality summaries for the four alluvial aquifers monitoring holes associated with the 84 Mesa.



FIGURE

TOTAL DISSOLVED SOLIDS VS. TIME FOR ALLUVIAL AQUIFERS

FIGURE 1.2-15

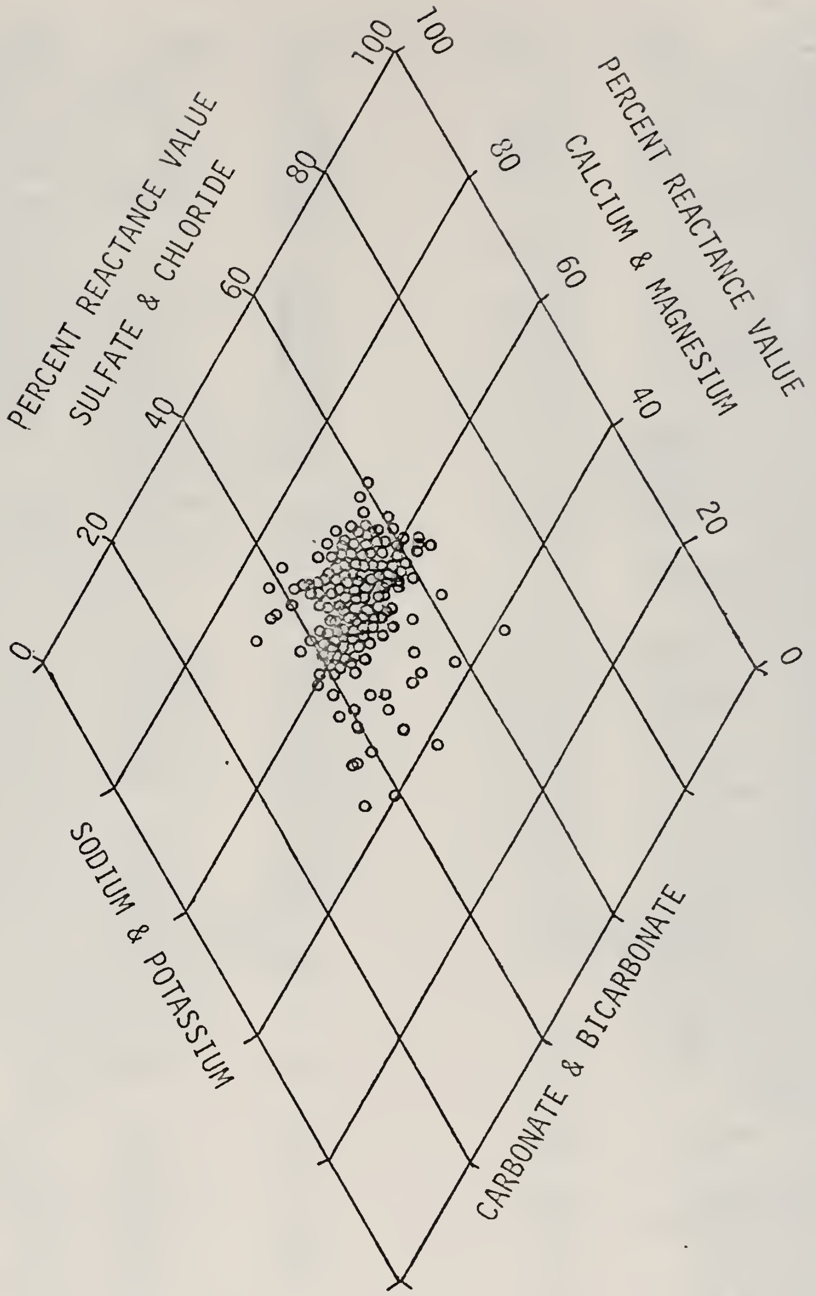


84 MESA
COMBINED ALLUVIAL AQUIFER
TRILINEAR DIAGRAM

WRIGHT WATER ENGINEERS, INC.
ENGINEERING CONSULTANTS
2420 ALCOTT STREET
DENVER, COLORADO 80211
(303) 458-6201

FIGURE 1.2-16

O MONITORING VALUE



TRACT C-a
COMBINED ALLUVIAL AQUIFER
TRILINEAR DIAGRAM

FIGURE 1.2-17

TABLE 1-2.21
BASELINE GROUND WATER QUALITY SUMMARY
ALLUVIAL HOLE G-S S-19

Param. No.	Item	High	Low	Geometric Mean	Geometric Deviation	No. of Analyses
410	Alkalinity (mg/1)	500.00	340.00	439.48	1.11	16
1106	Aluminum (mg/1)	0.20	< 0.10	0.200		1
71846	Ammonia (NH_4) (mg/1)	2.00	< 0.10	0.45	2.63	6
1000	Arsenic (ug/1)	100	100			1
1005	Barium (ug/1)	<1000.00	<1000.00	<1000.00	1.00	9
1010	Beryllium (ug/1)	2499.99	2499.99			1
440	Bicarbonate (mg/1)	610.00	380.00	524.37	1.14	16
1015	Bismuth (ug/1)	--	--	--	--	--
310	BOD (mg/1)	--	--	--	--	--
1020	Boron (ug/1)	2000.00	< 10.00	260.00	2510.00	13
71870	Bromide (mg/1)	< 0.10	< 0.10	< 0.10	1.00	2
1025	Cadmium (ug/1)	60.00	< 10.00	40.00	1.54	6
915	Calcium (mg/1)	240.00	33.00	102.21	1.49	16
445	Carbonate (mg/1)	96.00	< 0.10	36.33	2.03	4
940	Chloride (mg/1)	41.00	8.20	15.98	1.49	16
1030	Chromium (ug/1)	<10.00	<10.00	<10.00	1.00	11
340	COD (mg/1)	31.00	9.90	18.90	1.80	3
31615	Coliform, Fecal (Col/100 ml)	<10.00	<10.00			1
31501	Coliform, Total (Col/100 ml)	<10.00	<10.00			1
80	Color (PCU)	--	--	--	--	--
95	Conductivity, Spec. (umhos)	2000.00	1380.00	1646.17	1.08	16
1040	Copper (ug/1)	7999.97	100.00	890	6150.00	6
720	Cyanide (mg/1)	<0.01	< 0.01	<0.01	1.00	11
300	Dissolved Oxygen (mg/1)	--	--	--	--	--
950	Fluoride (mg/	0.60	0.10	0.24	1.71	16
1120	Gallium (ug/1)	10.00	1.00	3.16	5.09	2
1125	Germanium (ug/1)	--	--	--	--	--
900	Hardness (Ca, Mg) (mg/1)	730.00	550.00	654.28	1.09	15
1046	Iron (ug/1)	1600.00	<50.00	2510.00	8840.00	16
625	Kjeldahl Nitrogen (mg/1)	5.40	< 0.10	3.66	2.62	5
1049	Lead (ug/1)	13000.00	20.00	187.49	7.05	11
1130	Lithium (ug/1)	<100.00	<100.00	<100.00	1.00	3
925	Magnesium (mg/1)	135.00	12.00	83.39	1.74	16
1056	Manganese (ug/1)	13999.95	< 50.00	1290.00	6880.00	12
38260	MBAS (mg/1)	--	--	--	--	--
71890	Mercury (ug/1)	< 10.00	< 1.00	< 1.62	1.98	12
1060	Molybdenum (ug/1)	<100.00	<100.00	<100.00	1.00	2
1065	Nickel (ug/1)	200.00	30.00	84.42	2.12	9
71851	Nitrate (NO_3) (mg/1)	59.00	1.00	7.83	4.24	15
613	Nitrogen - Nitrite as N (mg/1)	5.20	< 0.01	0.35	11.94	3
631	Nitrite Plus Nitrate (N)(mg/1)	--	--	--	--	--
608	Nitrogen, Ammonia (mg/1)	0.40	0.10	0.36	3.77	4
607	Nitrogen, Organic (mg/1)	--	--	--	--	--
1330	Odor (severity)	--	--	--	--	--
550	Oil and Grease (mg/1)	--	--	--	--	--
	Organic Carbon (mg/1)					
681	Dissolved	174.00	2.00	32.19	5.29	12
689	Suspended	--	--	--	--	--
680	Total	--	--	--	--	--
	Pesticides (ug/1)	--	--	--	--	--
400	pH*	6.90	6.00	6.45	1.04	15
32730	Phenols (mg/1)	<1.00	<1.00	<1.00	1.00	2
	Phosphate (mg/1)	--	--	--	--	--
660	Dissolved (PO_4)	0.20	0.10	0.14	1.04	7
70507	Ortho (P)	0.10	.10	0.10	1.00	3
665	Total (P)	--	--	--	--	--
935	Potassium (mg/1)	10.00	1.10	3.94	2.10	7
	Radioactivity					
1503	Gross Alpha (pc/1)#	24.00	3.60	11.05	1.89	9
9503	Radium 226 (pc/1)					
80030	Natural Uranium (ug/1)	--	--	--	--	--
3501	Gross Beta (pc/1)	30.00	3.00	9.71	2.70	5
80050	SR^{90} (pc/1)	--	--	--	--	--
3515	CE^{137} (pc/1)	--	--	--	--	--
1145	Selenium (ug/1)	<10.00	<10.00	<10.00	1.00	12
955	Silica (SiO_2)	43.00	16.00	30.38	1.29	16
1075	Silver (ug/1)	30.00	<10.00			1
930	Sodium (mg/1)	310.00	155.00	211.76	1.19	16
931	Sodium Adsorption Ratio	--	--	--	--	--
540	Solids, Dissolved (mg/1)	1670.00	1150.00	1329.99	1.11	16
1080	Strontium (ug/1)	5800.00	2800.00	4029.87	1.67	1
945	Sulfate (mg/1)	780.00	450.00	532.29	4.91	16
746	Sulfide (mg/1)	0.40	<0.10			
11	Temperature (°F)*	55.40	46.50	50.52	3.02	16
1100	Tin (ug/1)	1.00	1.00	1.00	1.00	4
1150	Titanium (ug/1)	1000.00	1.00	3.43	3.22	10
70	Turbidity (JTU)	--	--	--	--	--
1085	Vanadium (ug/1)	--	--	--	--	--
1090	Zinc (ug/1)	5699.97	<100.00	1130	2370.00	8
1160	Zirconium (ug/1)	10.00	10.00			1

* Normal mean and standard deviation

#

TABLE 1.2-22
BASELINE GROUND WATER QUALITY SUMMARY
ALLUVIAL HOLE G-S S-22

Param. No.	Item	High	Low	Geometric Mean	Geometric Deviation	No. of Analyses
410	Alkalinity (mg/l)	1505.00	490.00	573.30	2.12	19
1106	Aluminum (mg/l)	100.00	100.00	100.00	1.00	2
71846	Ammonia (NH_4) (mg/l)	5.30	0.03	0.46	4.75	8
1000	Arsenic (ug/l)	< 10.00	< 10.00	<10.00	1.00	12
1005	Barium (ug/l)	<1000.00	<1000.00	<1000.00	1.00	9
1010	Beryllium (ug/l)	< 20.00	< 20.00			1
440	Bicarbonate (mg/l)	700.00	510.00	645.80	1.10	19
1015	Bismuth (ug/l)	--	--	--	--	--
310	BOO (mg/l)	--	--	--	--	--
1020	Boron (ug/l)	3599.99	30.00	400.03	3.00	18
71870	Bromide (mg/l)	0.40	< 0.10	0.20	2.67	2
1025	Cadmium (ug/l)	90.00	<10.00	26.21	3.00	3
915	Calcium (mg/l)	190.00	37.00	72.24	1.49	19
445	Carbonate (mg/l)	120.00	< 0.10	39.15	2.00	5
940	Chloride (mg/l)	41.00	9.90	18.15	1.36	19
1030	Chromium (ug/l)	100.00	<10.00	1.00	0.0	1
340	COD (mg/l)	20.00	5.00	9.15	2.04	4
31615	Coliform, Fecal (Col/100 ml)	< 10.00	<10.00			
31501	Coliform, Total (Col/100 ml)	60.00	60.00			
80	Color (PCU)	--	--	--	--	--
95	Conductivity, Spec. (umhos)	2230.00	1085.00	1756.53	1.19	18
1040	Copper (ug/l)	1100.00	100.00	312.61	2.35	9
720	Cyanide (mg/l)	0.03	< 0.01	0.01	1.41	3
300	Oissolved Oxygen (mg/l)	--	--	--	--	--
950	Fluoride (mg/	1.20	0.10	0.38	1.22	19
1120	Gallium (ug/l)	1.00	1.00			1
1125	Germanium (ug/l)	--	--	--	--	--
900	Hardness (Ca, Mg) (mg/l)	770.00	650.00	728.89	2.16	17
1046	Iron (ug/l)	15999.95	<50.00	3277.80	5.49	11
625	Kjeldahl Nitrogen (mg/l)	6.10	<0.10	0.83	6.04	10
1049	Lead (ug/l)	400.00	60.00	109.43	2.15	13
1130	Lithium (ug/l)	< 100.00	<100.00	<100.00	1.00	4
925	Magnesium (mg/l)	150.00	52.00	129.27	2.95	19
1056	Manganese (ug/l)	1300.00	< 50.00	335.52	3.11	11
38260	MBAS (mg/l)	< 0.01	< 0.01			1
71890	Mercury (ug/l)	< 2.00	< 1.00	< 1.31	1.42	13
1060	Molybdenum (ug/l)	<100.00	<100.00	<100.00	1.00	2
1065	Nickel (ug/l)	70.00	20.00	43.01	1.46	9
71851	Nitrate (NO_3) (mg/l)	4.40	0.60	2.25	1.60	17
613	Nitrogen - Nitrite as N (mg/l)	2.40	< 0.01	0.11	7.76	5
631	Nitrite Plus Nitrate (N)(mg/l)	--	--	--	--	--
608	Nitrogen, Ammonia (mg/l)	0.90	< 0.10	0.50	1.61	4
607	Nitrogen, Organic (mg/l)	--	--	--	--	--
1330	Odor (severity)	--	--	--	--	--
550	Oil and Grease (mg/l)	--	--	--	--	--
	Organic Carbon (mg/l)					
681	Dissolved	20.00	2.00	8.35	1.73	16
689	Suspended	--	--	--	--	--
680	Total	--	--	--	--	--
	Pesticides (ug/l)	--	--	--	--	--
400	pH*	7.20	6.00	6.54	0.41	17
32730	Phenols (mg/l)	5.00	< 1.00	1.50	2.24	4
	Phosphate (mg/l)					
660	Dissolved (PO_4)	< 0.10	< 0.10	< 0.10	0	9
70507	Ortho (P)	0.40	0.10	0.12	1.50	19
665	Total (P)	--	--	--	--	--
935	Potassium (mg/l)	14.00	1.00	4.72	2.05	10
	Radioactivity					
1503	Gross Alpha (pc/l)#	18.00	3.30	10.22	1.67	10
9503	Radium 226 (pc/l)					
80030	Natural Uranium (ug/l)	--	--	--	--	--
3501	Gross Beta (pc/l)	31.00	5.00	10.00	1.96	6
80050	SR^{90} (pc/l)	--	--	--	--	--
3515	CE^{137} (pc/l)	--	--	--	--	--
1145	Selenium (ug/l)	<10.00	<10.00	<10.00	1.00	13
955	Silica (SiO_2)	35.00	17.00	27.53	1.33	19
1075	Silver (ug/l)	20.00	10.00	11.09	1.41	4
930	Sodium (mg/l)	280.00	175.00	218.96	1.65	19
931	Sodium Adsorption Ratio	--	--	--	--	--
540	Solids, Oissolved (mg/l)	1560.00	1230.00	1408.46	1.06	19
1080	Strontium (ug/l)	6500.00	3600.00	4837.34	1.52	2
945	Sulfate (mg/l)	710.00	495.00	500.13	1.75	19
746	Sulfide (mg/l)	0.60	< 0.10	0.16	2.45	4
11	Temperature (°F)*	54.00	46.00	49.29	2.66	19
1100	Tin (ug/l)	1.00	1.00			2
1150	Titanium (ug/l)	100.00	1.00	3.33	6.67	9
70	Turbidity (JTU)	--	--	--	--	--
1085	Vanadium (ug/l)	--	--	--	--	--
1090	Zinc (ug/l)	1100.00	< 100.00	207.47	3.02	13
1160	Zirconium (ug/l)	--	--	--	--	--

* Normal mean and standard deviation

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TABLE 1.2-23

BASELINE GROUND WATER QUALITY SUMMARY
ALLUVIAL HOLE G-S S-23

Param. No.	Item	High	Low	Geometric Mean	Geometric Deviation	No. of Analyses
410	Alkalinity (mg/l)	580.00	430.00	485.15	1.56	19
1106	Aluminum (mg/l)	0.200	0.10	0.2		1
71846	Ammonia (NH_4) (mg/l)	2.00	<0.10	0.32	2.58	13
1000	Arsenic (ug/l)	< 10.00	< 10.00	< 10.00	1.00	12
1005	Barium (ug/l)	<1000.00	<1000.00	<1000.00	1.00	9
1010	Beryllium (ug/l)	400.00	400.00			
440	Bicarbonate (mg/l)	710.00	520.00	589.69	1.89	19
1015	Bismuth (ug/l)	--	--	--	--	--
310	BOO (mg/l)	--	--	--	--	--
1020	Boron (ug/l)	900.00	30.00	167.70	2.55	15
71870	Bromide (mg/l)	0.40	< 0.10	0.007	1.52	2
1025	Cadmium (ug/l)	80.00	< 10.00	20.76	2.50	6
915	Calcium (mg/l)	170.00	41.00	83.76	1.46	19
445	Carbonate (mg/l)	18.00	< 0.01	18.00		1
940	Chloride (mg/l)	55.00	9.90	17.15	1.52	19
1030	Chromium (ug/l)	100.00	< 10.00			1
340	COD (mg/l)	35.00	2.50	8.51	3.13	4
31615	Coliform, Fecal (Col/100 ml)	< 10.00	< 10.00			1
31501	Coliform, Total (Col/100 ml)	90.00	90.00	--	--	1
80	Color (PCU)	--	--	--	--	--
95	Conductivity, Spec. (umhos)	2275.00	1540.00	1796.86	1.09	19
1040	Copper (ug/l)	1000.00	<100.00	358.96	1.97	7
720	Cyanide (mg/l)	< 0.01	< 0.01	< 0.01	1.00	13
300	Dissolved Oxygen (mg/l)	--	--	--	--	--
950	Fluoride (mg/	0.70	0.10	0.26	1.69	19
1120	Gallium (ug/l)	--	--	--	--	--
1125	Germanium (ug/l)	--	--	--	--	--
900	Hardness (Ca, Mg) (mg/l)	800.00	650.00	721.97	1.05	17
1046	Iron (ug/l)	17699.96	< 50.00	1773.55	8.16	10
625	Kjeldahl Nitrogen (mg/l)	5.40	< 0.10	1.58	2.84	7
1049	Lead (ug/l)	300.00	30.00	99.53	2.35	13
1130	Lithium (ug/l)	< 100.00	<100.00	<100.00	1.00	4
925	Magnesium (mg/l)	160.00	67.00	120.65	1.20	19
1056	Manganese (ug/l)	12999.96	50.00	1167.03	14.34	9
38260	MBAS (mg/l)	< 0.01	< 0.01			1
71890	Mercury (ug/l)	< 2.00	< 1.00			13
1060	Molybdenum (ug/l)	<100.00	<100.00	<100.00	1.00	2
1065	Nickel (ug/l)	200.00	10.00	48.60	2.71	9
71851	Nitrate (NO_3) (mg/l)	4.60	< 0.10	2.51	2.29	16
613	Nitrogen - Nitrite as N (mg/l)	3.90	< 0.01	0.15	9.44	4
631	Nitrite Plus Nitrate (N)(mg/l)	--	--	--	--	--
608	Nitrogen, Ammonia (mg/l)	0.60	0.10	0.26	2.20	4
607	Nitrogen, Organic (mg/l)	--	--	--	--	--
1330	Odor (severity)	--	--	--	--	--
550	Oil and Grease (mg/l)	--	--	--	--	--
	Organic Carbon (mg/l)					
681	Dissolved	90.00	2.00	14.24	2.38	19
689	Suspended	--	--	--	--	--
680	Total	--	--	--	--	--
	Pesticides (ug/l)	--	--	--	--	--
400	pH*	7.00	6.00	6.93	1.06	18
32730	Phenols (mg/l)	--	--	--	--	--
	Phosphate (mg/l)					
660	Dissolved (PO_4)	1.00	< 0.10	0.24	2.99	9
70507	Ortho (P)	1.60	< 0.10	0.22	3.78	3
665	Total (P)	--	--	--	--	--
935	Potassium (mg/l)	14.00	< 1.00	3.62	2.25	9
	Radioactivity					
1503	Gross Alpha (pc/l)#	25.00	3.30	10.27	1.89	10
9503	Radium 226 (pc/l)					
80030	Natural Uranium (ug/l)	--	--	--	--	--
3501	Gross Beta (pc/l)	27.00	2.00	10.39	3.15	4
80050	SR^{90} (pc/l)	--	--	--	--	--
3515	CE^{137} (pc/l)	--	--	--	--	--
1145	Selenium (ug/l)	< 10.00	<10.00	<10.00	1.00	13
955	Silica (SiO_2)	44.00	17.00	27.34	1.22	19
1075	Silver (ug/l)	40.00	<10.00	15.87	2.23	3
930	Sodium (mg/l)	300.00	150.00	196.45	4.14	19
931	Sodium Adsorption Ratio	--	--	--	--	--
540	Solids, Dissolved (mg/l)	1500.00	1210.00	1399.62	8.39	19
1080	Strontium (ug/l)	5500.00	2600.00	3781.53	1.70	2
945	Sulfate (mg/l)	690.00	510.00	589.32	3.76	19
746	Sulfide (mg/l)	1.60	< 0.10	0.24	3.71	4
11	Temperature ($^{\circ}F$)*	55.00	46.20	49.01	2.45	19
1100	Tin (ug/l)	--	--	--	--	--
1150	Titanium (ug/l)	100.00	1.00	3.59	5.33	9
70	Turbidity (JTU)	--	--	--	--	--
1085	Vanadium (ug/l)	--	--	--	--	--
1090	Zinc (ug/l)	2599.99	< 100.00	124.07	1.88	13
1160	Zirconium (ug/l)	--	--	--	--	--

* Normal mean and standard deviation

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TABLE 1.2-24
BASELINE GROUND WATER QUALITY SUMMARY
ALLUVIAL HOLE G-S S-24

Param. No.	Item	High	Low	Geometric Mean	Geometric Deviation	No. of Analyses
410	Alkalinity (mg/l)	530.00	395.00	474.00	1.08	19
1106	Aluminum (mg/l)	<100.00	<100.00	<100.00	1.00	3
71846	Ammonia (NH_4) (mg/l)	2.00	0.10	0.40	2.63	8
1000	Arsenic (ug/l)	< 10.00	< 10.00	< 10.00	1.00	12
1005	Barium (ug/l)	<1000.00	<1000.00	<1000.00	1.00	9
1010	Beryllium (ug/l)	1300.00	1300.00			1
440	Bicarbonate (mg/l)	645.00	470.00	571.89	1.09	19
1015	Bismuth (ug/l)	--	--	--	--	--
310	BOD (mg/l)	5.20	5.20			1
1020	Boron (ug/l)	8199.98	<10.00	269.30	3.42	16
71870	Bromide (mg/l)	0.80	< 0.10			1
1025	Cadmium (ug/l)	100.00	<10.00	29.92	2.01	5
915	Calcium (mg/l)	180.00	31.00	81.79	1.54	19
445	Carbonate (mg/l)	36.00	< 0.10	32.17	1.08	4
940	Chloride (mg/l)	30.00	9.50	16.27	1.33	19
1030	Chromium (ug/l)	200.00	<10.00			1
340	COD (mg/l)	47.60	6.90	15.37	2.32	4
31615	Coliform, Fecal (Col/100 ml)	<10.00	<10.00			
31501	Coliform, Total (Col/100 ml)	<10.00	<10.00			
80	Color (PCU)	--	--	--	--	--
95	Conductivity, Spec. (umhos)	1910.00	1440.00	1633.17	1.08	19
1040	Copper (ug/l)	1300.00	<100.00	394.90	2.03	7
720	Cyanide (mg/l)	0.20	< 0.01	0.03	3.60	4
300	Dissolved Oxygen (mg/l)	--	--	--	--	--
950	Fluoride (mg/	0.80	0.10	0.26	1.57	19
1120	Gallium (ug/l)	--	--	--	--	--
1125	Germanium (ug/l)	--	--	--	--	--
900	Hardness (Ca, Mg) (mg/l)	700.00	415.00	624.49	1.14	17
1046	Iron (ug/l)	13300.00	< 50.00	3223.49	4.60	10
625	Kjeldahl Nitrogen (mg/l)	4.10	< 0.10	1.62	1.90	5
1049	Lead (ug/l)	800.00	10.00	141.17	3.34	13
1130	Lithium (ug/l)	<100.00	<100.00	<100.00	1.00	4
925	Magnesium (mg/l)	145.00	31.00	14.52	1.48	19
1056	Manganese (ug/l)		< 50.00	395.29	3.40	10
38260	MBAS (mg/l)	< 0.01	< 0.01			1
71890	Mercury (ug/l)	< 2.00	< 1.00	< 1.31	1.42	13
1060	Molybdenum (ug/l)	<100.00	<100.00	<100.00	1.00	2
1065	Nickel (ug/l)	100.00	10.00	35.11	2.64	9
71851	Nitrate (NO_3) (mg/l)	12.50	2.00	6.27	1.72	17
613	Nitrogen - Nitrite as N (mg/l)	24.50	< 0.01	0.49	12.90	5
631	Nitrite Plus Nitrate (N)(mg/l)	--	--	--	--	--
608	Nitrogen, Ammonia (mg/l)	0.50	< 0.10	0.21	1.94	4
607	Nitrogen, Organic (mg/l)	--	--	--	--	--
1330	Odor (severity)	--	--	--	--	--
550	Oil and Grease (mg/l)	--	--	--	--	--
	Organic Carbon (mg/l)					
681	Dissolved	30.00	2.00	11.27	2.03	16
689	Suspended	--	--	--	--	--
680	Total	--	--	--	--	--
	Pesticides (ug/l)	--	--	--	--	--
400	pH*	7.00	6.00	6.41	1.05	18
32730	Phenols (mg/l)	< 1.00	< 1.00	< 1.00	1.00	4
	Phosphate (mg/l)					
660	Dissolved (PO_4)	< 0.10	< 0.10	< 0.10	0	
70507	Ortho (P)	--	--	--	--	--
665	Total (P)	--	--	--	--	--
935	Potassium (mg/l)	12.00	1.00	3.14	2.09	9
	Radioactivity					
1503	Gross Alpha (pc/l)#	23.00	1.70	8.50	2.18	10
9503	Radium 226 (pc/l)					5
80030	Natural Uranium (ug/l)	--	--	--	--	--
3501	Gross Beta (pc/l)	24.00	4.00	13.07	2.24	4
80050	SR^{90} (pc/l)	--		--	--	--
3515	CE^{137} (pc/l)	--	--	--	--	--
1145	Selenium (ug/l)	<10.00	<10.00	<10.00	1.00	13
955	Silica (SiO_2)	30.00	17.00	26.27	1.16	19
1075	Silver (ug/l)	40.00	<10.00	0.03	1.23	2
930	Sodium (mg/l)	310.00	130.00	185.47	1.93	19
931	Sodium Adsorption Ratio	--	--	--	--	--
540	Solids, Dissolved (mg/l)	1320.00	1020.00	1218.49	1.06	19
1080	Strontium (ug/l)	4599.99	2899.93	3652.38	1.39	2
945	Sulfate (mg/l)	520.00	450.00	480.35	1.07	19
746	Sulfide (mg/l)	1.60	<0.01	978	2.00	2
11	Temperature (°F)*	52.50	44.20	47.90	1.07	19
1100	Tin (ug/l)	--	--	--	--	--
1150	Titanium (ug/l)	100.00	1.00	4.69	7.73	7
70	Turbidity (JTU)	--	--	--	--	--
1085	Vanadium (ug/l)	--	--	--	--	--
1090	Zinc (ug/l)	12999.95	100.00	119.23	2.16	13
1160	Zirconium (ug/l)	--	--	--	--	--

* Normal mean and standard deviation

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The temperature of alluvial water during the year follows similar seasonal patterns from hole to hole. During periods of highest alluvial water temperature, pH often reaches a peak shortly thereafter. This period generally corresponds to minimum saturation of the alluvium.

1.2.8.2.2 Perched Aquifer. A perched or upper water zone was encountered during drilling of deep aquifer hole G-S M-5. This water zone is located stratigraphically above the previously known deep bedrock aquifers.

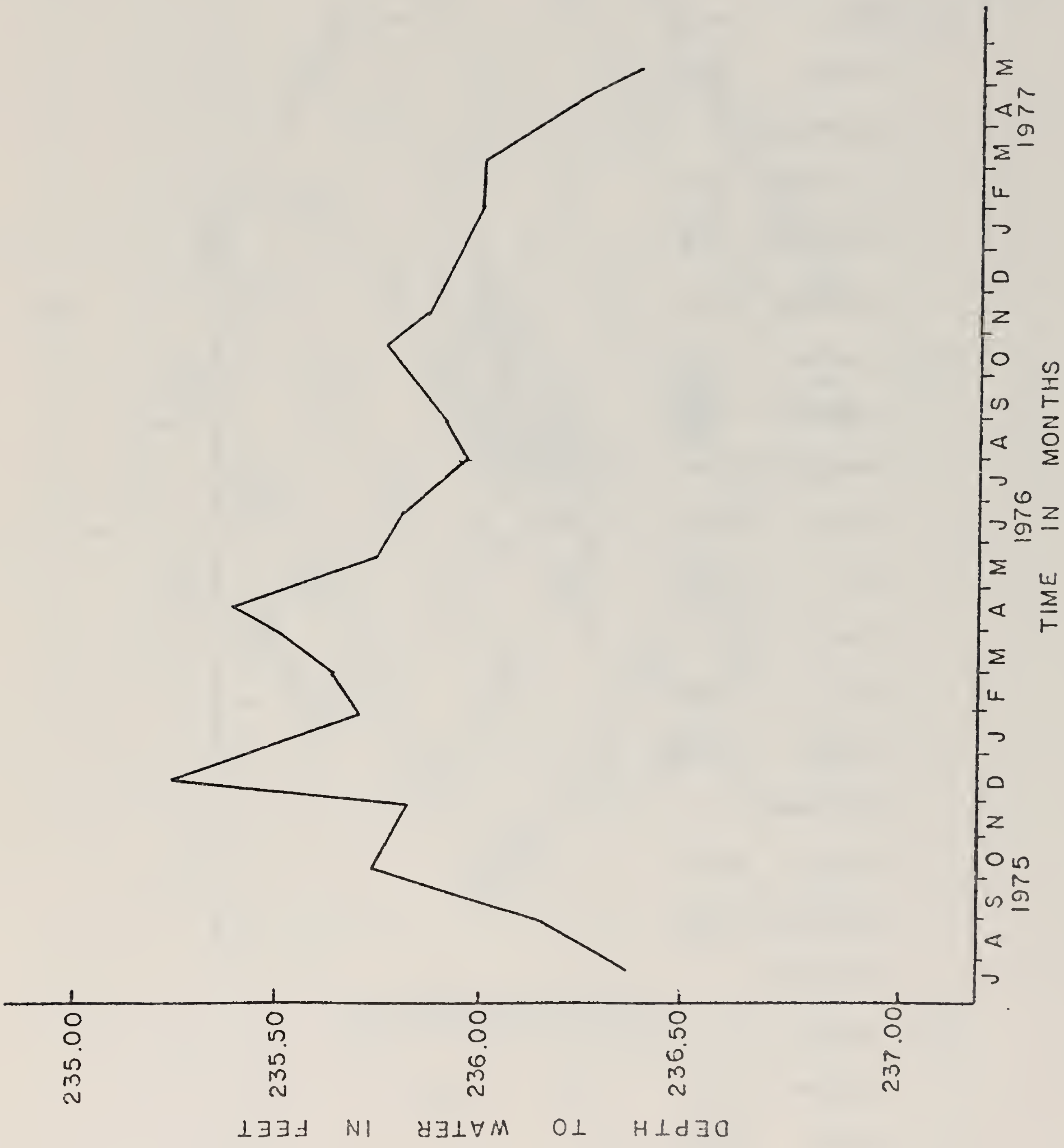
Figure 1.2.18 is a hydrograph showing the baseline water levels for G-S M-5.

Water level changes in the 84 Mesa upper water zone were investigated using hydrological data from G-S M-5, Table 1.2-25 A yearly sinesoidal water level trend appears to exist at G-S M-5 over the past two years of data. In general, a low water level occurs from May to July and a high water level occurs in March to May. There also appears to be smaller high water level periods that occur in October.

Water levels during the first 8 months of water year 1977 were lower than the corresponding period in 1976.

The uppermost water zone was monitored by collecting and analyzing water samples from G-S M-5 during the two year baseline period. Eight samples were collected covering a period July 1975 through April 1977.

The water quality from the upper water zone on 84 Mesa was typed according to percent concentrations of major constituents, see Figure 1-2.19. compared to other water types in the vicinity ("Final Environmental Baseline Report for Tract C-a and Vicinity") water from the upper water zone has considerably higher percent concentrations of sodium plus potassium, and sulfate plus chloride.



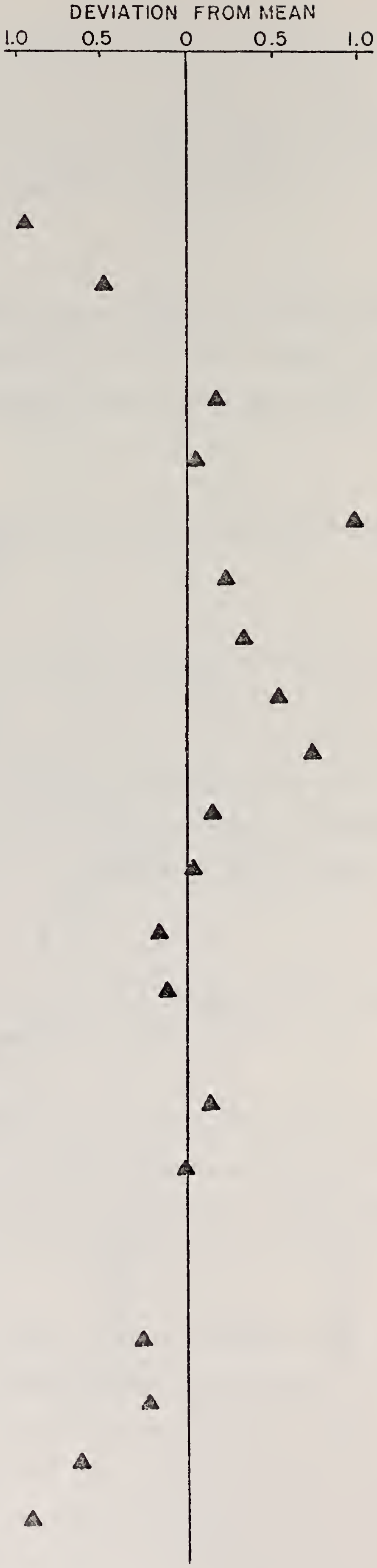
HYDROGRAPH DEEP AQUIFER MONITOR HOLE G-S M-5

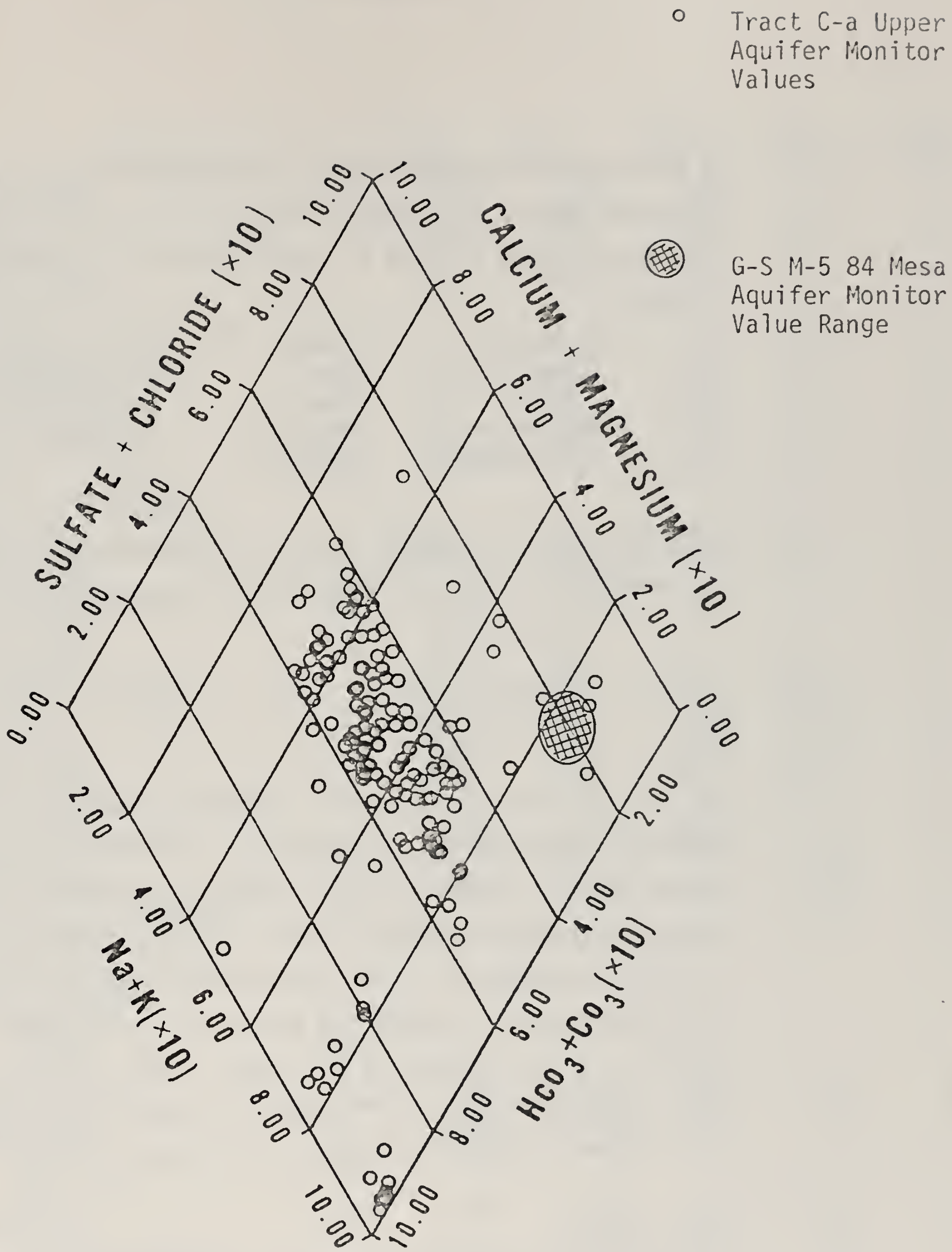
FIGURE 1.2-18

TABLE 1.2-25

DEEP AQUIFER MONITOR HOLE G-S M-5
STANDARD DEVIATION OF WATER LEVELS

YEAR	MONTH	DEPTH TO WATER IN FEET
1975	MAY	
	JUNE	
	JULY	236.39
	AUGUST	236.13
	SEPTEMBER	
	OCTOBER	235.73
	NOVEMBER	235.81
	DECEMBER	235.74
1976	JANUARY	235.70
	FEBRUARY	235.64
	MARCH	235.51
	APRIL	235.38
	MAY	235.75
	JUNE	235.70
	JULY	235.94
	AUGUST	235.90
	SEPTEMBER	
	OCTOBER	235.75
	NOVEMBER	235.84
	DECEMBER	
1977	JANUARY	
	FEBRUARY	235.98
	MARCH	235.96
	APRIL	236.21
	MAY	236.38





UPPER MOST WATER 84 MESA
WATER TYPE COMPARISON

FIGURE 1.2-19

A summary of water quality as collected over the two year baseline period is given on Table . Constituents which can be expected to show a large variation in concentrations include:

Ammonia
Barium
Boron
Cadmium
Carbonate
Copper
Iron
Lead
Manganese
Nitrate
Phosphate
Gross Alpha
Gross Beta
Selenium
Zinc

Constituents that appear to have relatively stable concentrations a standard deviation of less than 10 percent, are:

Alkalinity
pH
Sodium
Temperature

An idea of the water quality from the uppermost water zone in 84 Mesa can be gained by comparison with USPH suggested drinking water quality limits, Table 1.2-27. Constituents that at times exceed suggested drinking limits are iron, manganese, sodium, sulfate, cadmium and lead. Untreated water from this upper zone would not be considered potable. Constituents' concentrations that are high in the upper water zone also have similar high concentrations in the upper oil shale aquifer ("Final Environmental Baseline Report for Tract C-a and Vicinity").

CONCLUSIONS

A single uppermost water zone was monitored at 84 Mesa.

Hydrograph records indicate that water level trends in the alluvial aquifer closely follow surface water trends.

TABLE 1.2-26
BASELINE GROUND WATER QUALITY SUMMARY
DEEP AQUIFER HOLE G-S M-5

Param. No.	Item	High	Low	Geometric Mean	Standard Deviation	No. of Analyses
410	Alkalinity (mg/l)	380.00	366.00	354.38	25.70	8
1106	Aluminum (mg/l)	0.200	< 0.100	0.200	1.00	2
71846	Ammonia (NH_4) (mg/l)	1.10	0.20	0.55	0.35	6
1000	Arsenic (ug/l)	< 0.10	< 0.10	< 0.10	1.00	8
1005	Barium (ug/l)	< 1000.00	200.00	750.00	389.00	6
1010	Beryllium (ug/l)	--	--	--	--	-
440	Bicarbonate (mg/l)	465.00	305.00	419.38	51.09	8
1015	Bismuth (ug/l)	--	--	--	--	-
310	BOD (mg/l)	--	--	--	--	-
1020	Boron (ug/l)	1.2	0.10	0.44	0.37	8
71870	Bromide (mg/l)	0.30	< 0.10	0.25	0.07	2
1025	Cadmium (ug/l)	20.00	<10.00	8.75	6.40	8
915	Calcium (mg/l)	42.00	18.00	31.00	8.19	8
445	Carbonate (mg/l)	60.00	< 0.10	32.50	21.20	4
940	Chloride (mg/l)	41.00	11.00	21.63	8.73	8
1030	Chromium (ug/l)	< 100.00	<10.00	21.25	31.81	8
340	COD (mg/l)	35.00	16.00	25.00	10.54	3
31615	Coliform, Fecal (Col/100 ml)	--	--	--	--	-
31501	Coliform, Total (Col/100 ml)	--	--	--	--	-
80	Color (PCU)	--	--	--	--	-
95	Conductivity, Spec. (umhos)	4000.00	2550.00	3282.50	410.83	8
1040	Copper (ug/l)	1700.00	<100.00	412.50	559.17	8
720	Cyanide (mg/l)		< 0.10			
300	Dissolved Oxygen (mg/l)	--	--	--	--	-
950	Fluoride (mg/l)	0.50	0.26	0.28	0.10	8
1120	Gallium (ug/l)	--	--	--	--	-
1125	Germanium (ug/l)	--	--	--	--	-
900	Hardness (Ca, Mg) (mg/l)	335.00	160.00	277.14	65.31	7
1046	Iron (ug/l)	16900.00	< 50.00	8331.25	6943.90	8
625	Kjeldahl Nitrogen (mg/l)	--	--	--	--	-
1049	Lead (ug/l)	700.00	< 10.00	277.50	234.26	8
1130	Lithium (ug/l)	200.00	100.00	150.00	70.71	2
925	Magnesium (mg/l)	67.00	28.00	48.75	14.29	8
1056	Manganese (ug/l)	4800.00	60.00	1032.50	1556.33	8
38260	MBAS (mg/l)	--	--	--	--	-
71890	Mercury (ug/l)	< 2.00	< 1.0	1.25	0.46	8
1060	Molybdenum (ug/l)	0.100	0.100	100.00	0	2
1065	Nickel (ug/l)	100.00	30.00	58.00	29.49	5
71851	Nitrate (NO_3) (mg/l)	5.50	0.10	1.14	1.96	7
613	Nitrogen - Nitrite as N (mg/l)	0.100	0.010	0.04	0.04	3
631	Nitrite Plus Nitrate (N)(mg/l)	--	--	--	--	-
608	Nitrogen, Ammonia (mg/l)	0.40	0.20	10.20	13.83	2
607	Nitrogen, Organic (mg/l)	--	--	--	--	-
1330	Odor (severity)	--	--	--	--	-
550	Oil and Grease (mg/l)	--	--	--	--	-
	Organic Carbon (mg/l)					
681	Dissolved	--	--	--	--	-
689	Suspended	--	--	--	--	-
680	Total	--	--	--	--	-
	Pesticides (ug/l)	--	--	--	--	-
400	pH*	7.80	6.60	6.96	0.39	8
32730	Phenols (mg/l)	0.004	0.001	0.33	0.57	3
	Phosphate (mg/l)	0.100	0.100	3.50	2.42	8
660	Dissolved (PO_4)	--	--	--	--	-
70507	Ortho (P)	--	--	--	--	-
665	Total (P)	--	--	--	--	-
935	Potassium (mg/l)	8.50	1.80	4.26	3.68	3
	Radioactivity	--	--	--	--	-
1503	Gross Alpha (pc/l)#	31.0	3.90	15.32	10.28	5
9503	Radium 226 (pc/l)	0.30	0.20	0.65	0.49	2
80030	Natural Uranium (ug/l)	--	--	--	--	-
3501	Gross Beta (pc/l)	74.0	16.0	44.25	23.69	4
80050	SR^{90} (pc/l)	--	--	--	--	-
3515	CE^{137} (pc/l)	--	--	--	--	-
1145	Selenium (ug/l)	100.00	100.00	25.00	46.29	8
955	Silica (SiO_2)	--	--	--	--	-
1075	Silver (ug/l)	20.00	10.00	12.00	4.47	5
930	Sodium (mg/l)	870.00	610.00	762.50	82.41	8
931	Sodium Adsorption Ratio	--	--	--	--	-
540	Solids, Dissolved (mg/l)	--	--	--	--	-
1030	Strontium (ug/l)	5700.00	100.00	2900.00	3959.79	2
945	Sulfate (mg/l)	1740.00	1100.00	1456.25	215.13	8
746	Sulfide (mg/l)	1.90	0.20	1.63	0.55	3
11	Temperature (°F)*	57.2	49.8	52.8	2.8	8
1100	Tin (ug/l)	--	--	--	--	-
1150	Titanium (ug/l)	100.00	50.00	90.00	22.36	4
70	Turbidity (JTU)	--	--	--	--	-
1085	Vanadium (ug/l)	100.00	100.00	100.00	0	2
1090	Zinc (ug/l)	1200.00	<100.00	687.5	470.3	8
1160	Zirconium (ug/l)	--	--	--	--	

* Normal mean and standard deviation

TABLE 1.2-27

DRINKING WATER QUALITY LIMITS
COMARED WITH
G-S M-5 WATER QUALITY AT 84 MESA

	USPHS Limits	G-S M-5 Percent of Samples Limit Exceeded
Arsenic (mg/l)	0.05	0
Barium (mg/l)	1.00	0
Cadmium (mg/l)	0.01	5
Chloride (mg/l)	250.00	0
Chromium (mg/l)	0.05	0
Copper (mg/l)	1.00	2
Cyanide (mg/l)	0.20	0
Fluoride (mg/l)	2.40	0
Iron (mg/l)	0.30	75
Lead (mg/l)	0.05	75
Manganese (mg/l)	0.05	100
Nitrate (mg/l)	45.00	0
Selenium (mg/l)	0.01	0
Silver (mg/l)	0.05	0
sodium (mg/l)	115.00	100
Sulfate (mg/l)	250.00	100
TDS (mg/l)	500.00	--
Zinc (mg/l)	5.00	0
Radium_{226} (pc/l)	3.00	0
Strontium_{90} (pc/l)	10.00	--
Hardness (mg/l)	500.00	0

-- Insufficient Data

The unusually dry period in water year 1977 appears to have caused a decrease in water levels during this same period in the perched water zone.

Water quality from the perched water zone is generally poor quality.

The water type from this perched zone is distinct from water types encountered in Tract C-a aquifer systems, though it is most similar to the upper oil shale aquifer water type ("Final Environmental Baseline Report for Tract C-a and Vicinity").

Deep Bedrock Aquifers. Two deep bedrock aquifers are known to exist in the Piceance Creek Basin. An extensive baseline study of Tract C-a encompassed these two aquifers (upper and Lower) in the areas of 84 Mesa. No special study exclusively for 84 Mesa was considered necessary. The "Final Environmental Baseline Report for Tract C-a and Vicinity" gives a detailed analysis of these aquifers.

APPENDIX A

RIO BLANCO OIL SHALE PROJECT
PROGRESS REPORT 11

MARCH, APRIL, MAY, 1977

HYDROLOGIC PROGRAM
SECTION 1.2

RAW DATA
FOR
INTERPRETIVE TEXT

SEPTEMBER 15, 1977

GULF OIL CORPORATION
and
STANDARD OIL COMPANY (INDIANA)

TABLE OF CONTENTS

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U.S.G.S. Precipitation and Surface Water Data 1.2.2

Water Quality Data, Alluvial Aquifer Monitoring Program 1.2.3

Water Quality Data, Deep Aquifer Monitoring Program 1.2.7

SURFACE WATER DATA COLLECTION

SECTION 1.2.2

U.S.G.S. SURFACE WATER DATA

EXPLANATION - U.S.G.S. GAGE DATA

Discharge, Water Year 1977

- Corral Gulch South of 84 Mesa
- Tributary to Yellow Creek East of 84 Mesa
- Upper Big Duck Creek North of 84 Mesa
- Lower Big Duck Creek South of 84 Mesa

Continuous Mean Conductivity, Water Year 1977

- Corral Gulch South of 84 Mesa

Continuous Mean Temperature, Water Year 1977

- Corral Gulch South of 84 Mesa

Chemical Analysis, Water Year 1977

- Corral Gulch South of 84 Mesa

Chemical Analysis, Water Year 1975 Final

- Box Elder Gulch near West Line Tract C-a
- Corral Gulch near West Line Tract C-a
- Corral Gulch East of Tract C-a
- Corral Gulch South of 84 Mesa

9-192-a

Daily Gage Height, in Feet, and Discharge, in Second-Feet, of Corral Gulch ~~River~~ Creek

PRELIMINARY RECORD

~~Near~~ At 84 Ranch, Colo for the Year Ending September 30, 1977

Drainage Area 37.8 Square Miles. Water-Stage Recorder CONTINUOUS Ratio 1 : 6

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

CORRAL GULCH
@ 84 RANCH, COLO.
1977

File Number { Washington 09306244
District

Used rating table ~~dated~~ No 2 MARCH 21 1977

Gage Read to .... Once / Twice a Day by ....

Gage heights used to ~~half tenths between ... and ... feet;~~ hundredths below ~~and tenths above these limits.~~

Day	October Gage height	October Discharge	November Gage height	November Discharge	December Gage height	December Discharge	January Gage height	January Discharge	February Gage height	February Discharge	March Gage height	March Discharge
1	a	.01	a	.03	a	.03	a	.03	a	.02	a	.03
2		.01		.03		.03		.03		.02		.03
3		.01		.03		.03		.03		.02		.03
4		.01		.03		.03		.03		.02		.03
5		.02		.03		.03		.03		.02		.04
6		.02		.03		.03		.03		.02		.06
7		.02		.03		.03		.03		.02	a	.08
8		.02		.03		.03		.03		.02	1.12	.14
9		.02		.03		.03		.03		.02	1.16	.19
10		.02		.03		.03		.03		.02	1.07	.07
11		.02		.03		.03		.03		.03	a	.05
12		.02		.03		.03		.03		.03		.05
13		.02		.03		.03		.03		.03		.05
14		.02		.03		.03		.03		.03		.05
15		.02	a	.03		.03		.03		.03		.05
16		.02	1.12b	.03	a	.04		.02		.03		.05
17		.02	1.12	.03	1.12b	.04		.02		.03		.05
18		.02	1.11	.03	1.10b	.04		.02		.03		.06
19		.02	1.13	.03	a	.04		.02		.03		.06
20		.02	1.4	.03		.04		.02		.03		.06
21		.02	1.13	.03		.03		.02		.03		.06
22		.02	1.15	.03		.03		.02	a	.03		.06
23		.02	[illegible]	.03		.03		.02		.03		.07
24		.02	1.15	.03		.03		.02		.03		.07
25		.02	1.17	.03		.03		.02		.03		.07
26		.02	1.17b	.03		.03		.02		.03		.07
27		.02	a	.03		.03		.02		.03		.07
28		.02		.03		.03		.02		.03		.07
29		.03		.03		.03		.02	a	.03		.07
30		.03	a	.03		.03		.02			a	.07
31	0	.03	Y	X	a	.03	a	.02			a	.08
Total		0.61		0.90		0.96		0.77		0.77		1.99
Mean		✓		✓		✓		✓				
Second-feet per square mile												
Run-off in inches												
Run-off in acre-feet												
Maximum												
Minimum												

October, days 11–20: control submerged out

Day	April Gage height	April Discharge ✓	May Gage height	May Discharge ✓	June Gage height	June Discharge ✓	July Gage height	July Discharge	August Gage height	August Discharge	September Gage height	September Discharge
1	1.86	.08	1.84	.06	1.76	.01	1.72	0				
2	1.86	.08	1.83	.05	1.76	.01	1.71	0				
3	1.87	.08	1.83	.05	1.76	.01	1.70	0				
4	1.87	.08	1.83	.05	S	.01	1.72	0				
5	1.87	.08	1.83	.05	S	.01	1.70	0				
6	1.87	.09	1.83	.05	S	.01	1.68	0				
7	1.88	.09	1.81	.04	S	.01	1.67	0				
8	1.88	.09	1.81	.04	S	.01	1.66	0				
9	1.87	.08	1.80	.04	(64) S	.01	1.65	0				
10	1.87	.08	1.80	.04	S	0	1.65	0				
11	1.87	.08	1.78	.03	S	0	1.65	0				
12	1.88	.09	1.78	.03	S	0	1.63	0				
13	1.87	.08	1.80	.04	1.68	0	1.56	0				
14	1.86	.08	1.82	.05	1.67	0	1.60	0				
15	1.86	.08	1.82	.05	1.67	0	1.55	0				
16	1.86	.03	1.82	.05	S	0	1.50	0				
17	1.85	.07	1.81	.04	1.63	0	S	0				
18	1.85	.07	1.80	.04	1.63	0	S	0				
19	1.85	.07	1.80	.04	1.64	0	1.55	0				
20	1.85	.07	1.80	.04	(70) S	0	1.51	0				
21	1.84	.06	1.80	.04	1.66	0	1.51	0				
22	1.84	.06	1.80	.04	(1.72) S	0	1.51	0				
23	1.84	.06	1.80	.04	1.67	0	S	0				
24	1.84	.06	1.80	.04	1.67	0						
25	1.83	.05	1.79	.03	1.66	0	1.77	.02				
26	1.83	.05	1.80	.04	1.66	0						
27	1.84	.06	1.80	.04	1.65	0						
28	1.85	.07	1.80	.04	1.68	0						
29	1.85	.07	1.80	.04	1.70	0						
30	1.84	.06	[illegible]	.03	1.70	0						
31			[illegible]	.02	X	X			X	Y		
Total	2.16											

"a" No gage height

* Obs No flow

"b" [illegible] shift [illegible]

9-192-a. July 1937

Daily Gage Height, in Feet, and Discharge, in Second-Feet, of Yellow Creek Tributary ~~River~~ Creek

At ~~Near~~ "84" Ranch, Colorado for the Year Ending September 30, 19 77

Drainage Area .... Square Miles. Water-Stage Recorder Graphical Ratio 1 : 6

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Gage Read to .... Once / Twice a Day by ....

Yellow Creek Tributory
nr. 84 Ranch.
1977 wyr.

File Number { Washington C9306.2 / District ....

Used rating table dated ....

Gage heights used to half tenths between ...... and ...... fe / hundredths below and tenths above these limits.

	October		November		December		January		February		March		April		May		June		July		August		September	
Day	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1			*																					
2																								
3																								
4																								
5																No Flow								
6					*																			
7	*																							
8									*															
9																								
10											*				*									
11																				No Flow				
12												No Flow		No Flow										
13																								
14								No Flow		No Flow							*							
15		No Flow		No Flow		No Flow					*													
16																								
17													*				No Flow		*					
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26					*																			
27									*															
28																								
29									X	X														
30																								
31				X																				
Total		0		0		0		0		0														
Mean second-feet per square mile																								
Run-off in inches / Run-off in acre-feet																								
Maximum																								
Minimum																								

Max. Disch. .... Sec-ft at .... on .... (G. H. .... ft), Max. G. H. .... ft at .... on ....

Min. D........ Sec-ft on .... (G. H. .... ft), Min. G. H. .... ft on ....

Note! * means observation of No flow

Year

Computed .... Checked ....

Dish applied No flow Dish checked

G H copied No flow G H checked

Period Year

9-199-a. July 1937

Daily Gage Height, in Feet, and Discharge, in Second-Feet, of DUCK CR. AT UPPER STATION ~~River~~ ~~Creek~~

Near 84 RANCH, COLORADO for the Year Ending September 30, 1977

Drainage Area 39.1 Square Miles. Water-Stage Recorder CONTINUOUS Ratio 1 : 6

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

DUCK CR. @ UPPER
STA. NR 84 RANCH, CO
1977

File Number Washington 09306248
District

Used rating table dated NO. 1

Gage Read to .... Once / Twice a Day by ....

Gage heights used to half tenths between ...... and ...... feet; hundredths below and tenths above these limits.

Day	October Gage height	October Discharge	November Gage height	November Discharge	December Gage height	December Discharge	January Gage height	January Discharge	February Gage height	February Discharge	March Gage height	March Discharge	Day	April Gage height	April Discharge	May Gage height	May Discharge	June Gage height	June Discharge	July Gage height	July Discharge	August Gage height	August Discharge	September Gage height	September Discharge
1													1												
2													2												
3													3												
4													4												
5													5												
6													6												
7													7				No Flow								
8													8												
9													9												
10													10												
11													11												
12													12								No Flow				
13		No Flow		No Flow		No Flow		No Flow		No Flow		No Flow	13												
14													14												
15													15												
16													16												
17													17						No Flow						
18													18												
19													19												
20													20												
21													21												
22													22												
23													23				No Flow								
24													24												
25													25												
26													26												
27													27												
28													28												
29									X	X			29												
30													30												
31				X									31		X										
Total		0		0		0		0		0		0			0										
Second-feet per square mile																									
Run-off in inches																									
Run-off in acre-feet																									
Maximum																									
Minimum																									

Quarter	First	Second	Third	Fourth
Computed				
Checked				
Date				
Disch. applied	No Flow			
Disch. checked				
Date				
G. H. copied	[illegible]			
G. H. checked				
Date				

9-199-a. July 1937

Daily Gage Height, in Feet, and Discharge, in Second-Feet, of Duck ~~River~~ Creek

PRELIMINARY RECORD SUBJECT TO REVISION

near "84" Ranch, Colorado for the Year Ending September 30, 1977

Drainage Area .... Square Miles. Water-Stage Recorder CONTINUOUS Ratio 1 : 6

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Gage Read to .... Once / Twice a Day by ....

Duck Cr. nr. 84 Ranch, Colo.
1977 w.yr.

File Number { Washington 09.306250 / District ....

Used rating table dated No. 1

Gage heights used to half tenths between ..... and ..... feet; hundredths below and tenths above these limits.

Day	October Gage height	October Discharge	November Gage height	November Discharge	December Gage height	December Discharge	January Gage height	January Discharge	February Gage height	February Discharge	March Gage height	March Discharge
1					a							
2					Recorder malfunction							
3												
4												
5												
6												
7					a							
8												
9												
10												
11												
12												
13												
14												
15												
16												
17		No Flow		No Flow		No Flow		No Flow		No Flow		No Flow
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29									X	X		
30			a									
31			x	X								
Total		0		0		0		0		0		0
Mean												
Second-feet per square mile												
Run-off in inches / acre-feet												
Maximum												
Minimum												

Day	April Gage height	April Discharge	May Gage height	May Discharge	June Gage height	June Discharge	July Gage height	July Discharge	August Gage height	August Discharge	September Gage height	September Discharge
1								0				
2								0				
3								0				
4								0				
5								0				
6				No Flow				0				
7								0				
8								0				
9								0				
10								0				
11								0				
12								0				
13								0				
14								0				
15								0				
16								0				
17		No Flow						0				
18								0				
19								0				
20								0				
21								0				
22								0				
23								0				
24							5	.08				
25								0				
26								0				
27								0				
28								0				
29								0				
30								0				
31	X	X			X	x		0			X	X
Total		0		0		0		.08				
Mean												
Second-feet per square mile												
Run-off in inches / acre-feet												
Maximum												
Minimum												

G. H. copied Fiene-Van
Disch. applied No Flow-mm
Computed ....
Checked ....
Date ....

Max. Disch. .... Sec.-ft. at .... on .... (G. H. .... ft.). Max. G. H. .... ft. at .... on ....

Min. Disch. .... Sec.-ft. on .... (G. H. .... ft.). Min. G. H. .... ft. on ....

*-DISCHARGE ESTIMATED, ... VARIABLE SHIFT DISCHARGE ESTIMATED FOR "a"-NO GAGE HEIGHT RECORD, "b"-ICE EFFECT, "c"-OBSERVATION OF NO FLOW

Year 1976

UNITED STATES DEP

09306244
CORRAL GULCH AT 84 RANCH, CO.
SPECIFIC CONDUCTANCE (MICROMHOS/

PROVISIONAL DATA FOR WATER YEAR

S	DATE	MAX	MIN	MEAN	
	5-17	1660	1530	1600	AM PM
A	5-18	1690	1290	1590	AM PM
A	5-19	1710	1410	1640	AM PM
	5-20	1750	1620	1700	AM PM
A	5-21	1780	1580	1710	AM PM
A	5-22	1800	1560	1700	AM PM
A	5-23	1810	1450	1660	AM PM
A	5-24	1810	1390	1630	AM PM
A	5-25	1780	1470	1610	AM PM
A	5-26	1890	1540	1700	AM PM
A	5-27	1980	1540	1800	AM PM
A	5-28	2050	1750	1960	AM PM
A	5-29	2120	1650	1890	AM PM
A	5-30	1860	1650	1760	AM PM
A	5-31	1890	1700	1790	AM PM
	6-01	1820	1770	1800	AM PM
	6-02	1810	1750	1790	AM PM
	6-03	1800	1730	1770	AM PM
A	6-04	1810	869	1530	AM PM
AR	6-05	1810			AM PM
A	6-06	1790	937	1590	AM PM
A	6-07	1780	842	1640	M M
	6-08	1760	1650		

Partial Flow

PRINTED IN U.S.A.

UNITED STATES DEPAR
PRIMAR

09306244
CORRAL GULCH AT 84 RANCH, CO.
SPECIFIC CONDUCTANCE (MICROMHOS/C

PROVISIONAL DATA FOR WATER YEAR E

S	DATE	MAX	MIN	MEAN	
					PM
AR	6-09	1750	P. E.		AM PM
AR	6-10	~~1480~~	10		AM PM
AR	6-11	~~1140~~	Flow		AM PM
AR	6-12	~~1150~~			AM PM
AR	6-13	~~1150~~			AM PM
AR	6-14	~~1110~~			AM PM
AR	6-15	~~977~~			AM PM
AR	6-16	933		*	AM PM
	PERIOD	2120	842		

NOTE.- SYMBOLS USED ABOVE HAVE THE FOLL
A - SUCCESSIVE RECORDED PUNCH RE
R - ONE OR MORE INPUT VALUE IS
* - DAILY SUMMARY IS FOR AN INCL
% - UNIT VALUES RECORD WRITTEN

SHIFT
SHIFT
SHIFT
SHIFT
SHIFT
SHIFT

```
                          UNITED STATES DEPA
                                        PRIMA
       09306244
       CORRAL GULCH AT 84 RANCH, CO.
       SPECIFIC CONDUCTANCE (MICROMHOS/

       PROVISIONAL DATA FOR WATER YEAR

  S  DATE        MAX      MIN      MEAN


        10-06    1420     1370     1400*  AM
                                          .PM
        10-07    1510     1410     1460   AM
                                          PM
  AR    10-08    1620     1490     1550   AM
                                          PM
        10-09    1660     1540     1610   AM
                                          PM
        10-10    1720     1600     1660   AM
                                          PM

        10-11    1760     1660     1720   AM
                                          PM
        10-12    1820     1720     1770   AM
                                          PM
        10-13    1910     1830     1860*  AM
                                          PM
   PERIOD        1910     1370


  NOTE.-  SYMBOLS USED ABOVE HAVE THE FOI
          A - SUCCESSIVE RECORDED PUNCH I
          R - ONE OR MORE INPUT VALUE IS
          * - DAILY SUMMARY IS FOR AN IN(
          % - UNIT VALUES RECORD WRITTEN

--------------------------------------------- SHIF
                                              SHIF
                                              SHIF
                                              SHIF
                                              SHIF
```

Conductivity Probe

[illegible]

UNITED STATES DEP
PRIM

09306244
CORRAL GULCH AT 84 RANCH, CO.
SPECIFIC CONDUCTANCE (MICROMHOS

PROVISIONAL DATA FOR WATER YEAR

S	DATE	MAX	MIN	MEAN	
	10-13	1850	1770	1830	AM
					PM
	10-14	1870	1800	1820	AM
					PM
	10-15	1850	1770	1830	AM
					PM
	10-16	1850	1770	1830	AM
					PM
	10-17	1850	1770	1840	AM
					PM
AR	10-18		1750		AM
					PM
AR	10-19		1750		AM
					PM
AR	10-20		1750		AM
					PM
AR	10-21		1730		AM
					PM
AR	10-22		1730		AM
					PM
AR	10-23		1740		AM
					PM
AR	10-24		1760		AM
					PM
AR	10-25		1810		AM
					PM
AR	10-26		1780		AM
					PM
AR	10-27		1790		AM
					PM
AR	10-28		1770		AM
					PM
AR	10-29		1790		AM
					PM
AR	10-30		1770		AM
					PM
AR	10-31		1780		AM
					PM
AR	11-01		1780		AM
					PM
AR	11-02		1780		AM
					PM
AR	11-03		1810		AM
					PM
AR	11-04		1790		AM

```
                   UNITED STATES DEPAF
                               PRIMAF
      09306244
     -CORRAL GULCH AT 84 RANCH, CO.
      SPECIFIC CONDUCTANCE (MICROMHOS/(

      PROVISIONAL DATA FOR WATER YEAR (

S  DATE     MAX    MIN   MEAN

                               PM
AR 11-05          1790         AM
                               PM

AR 11-06          1790         AM
                               PM
AR 11-07          1820         AM
                               PM
AR 11-08          1820         AM
                               PM
AR 11-09          1800         AM
                               PM
AR 11-10          1800         AM
                               PM

AR 11-11          1810         AM
                               PM
AR 11-12          1790         AM
                               PM
AR 11-13          1830         AM
                               PM
AR 11-14          1820         AM
                               PM
AR 11-15          1780         AM
                               PM

AR 11-16          1760         AM
                               PM
AR 11-17          1780         AM
                               PM
AR 11-18          1790         AM
                               PM
AR 11-19          1790         AM
                               PM
AR 11-20          1770         AM
                               PM

AR 11-21          1770         AM
                               PM
AR 11-22          1780         AM
                               PM
AR 11-23          1780         AM
                               PM
AR 11-24          1660         AM
                               PM
AR 11-25          1680         AM
                               PM

AR 11-26          1710
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                              UNITED STATES DEPARTMENT OF THE IN
                                        PRIMARY COMPUTATIONS (
        09306244
        CORRAL GULCH AT 84 RANCH, CO.
        SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C)

        PROVISIONAL DATA FOR WATER YEAR ENDING SEPT. 30,

   S  DATE       MAX      MIN     MEAN              1          2

    R 11-27                              AM
                                         PM
   AR 11-28              1640            AM
                                         PM                  1670
   AR 11-29              1590            AM
                                         PM      1620        1590
   AR 11-30              1640            AM
                                         PM      1660        1660

   AR 12-01              1640            AM
                                         PM
   AR 12-02              1630            AM
                                         PM      1660        1650
   AR 12-03              1630            AM
                                         PM      1660        1630
   AR 12-04              1630            AM
                                         PM      1650        1650
   AR 12-05              1620            AM
                                         PM      1670        1650

   AR 12-06              1620            AM
                                         PM      1690        1650
   AR 12-07              1620            AM
                                         PM      1660        1640
   AR 12-08              1610            AM      1730
                                         PM      1640        1620
   AR 12-09              1560            AM
                                         PM      1630        1590
   AR 12-10              1560            AM
                                         PM      1610        1590

   AR 12-11              1530            AM
                                         PM      1580        1560
   AR 12-12              1520            AM
                                         PM      1550        1550
   AR 12-13              1380            AM
                                         PM      1530        1530
   AR 12-14              1360            AM
                                         PM      1400        1400
   AR 12-15              1350            AM
                                         PM      1400        1390

   AR 12-16              1810          * AM
                                         PM      1810        1810
     PERIOD      1870    1350


   NOTE.-  SYMBOLS USED ABOVE HAVE THE FOLLOWING MEANINGS
           A - SUCCESSIVE RECORDED PUNCH READINGS DIFFER B
           R - ONE OR MORE INPUT VALUE IS OUTSIDE THE RANG
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                    UNITED STATES DEPA
                                  PRIMA
     09306244
     CORRAL GULCH AT 84 RANCH, CO.
     TEMPERATURE (DEG. C) OF WATER

     PROVISIONAL DATA FOR WATER YEAR

 S  DATE       MAX      MIN     MEAN


 A  10-06     12.5      6.9      9.8* AM
                                      PM
 A  10-07     17.8      3.3      8.7  AM
                                      PM
 A  10-08     19.0      1.6      8.4  AM
                                      PM
 A  10-09     20.0      2.5      9.2  AM
                                      PM
 A  10-10     19.6      2.9      9.3  AM
                                      PM

 A  10-11     16.6      4.1      8.7  AM
                                      PM
 A  10-12     18.1      3.7      8.9  AM
                                      PM
 A  10-13      6.2      2.0      3.5* AM
                                      PM
  PERIOD      20.0      1.6

 NOTE.-  SYMBOLS USED ABOVE HAVE THE FOL
         A - SUCCESSIVE RECORDED PUNCH R
         R - ONE OR MORE INPUT VALUE IS
         * - DAILY SUMMARY IS FOR AN INC
         % - UNIT VALUES RECORD WRITTEN

                                    SHIF
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                                   UNITED STATES DEPART
                                                PRIMARY
                    09306244   -
                    CORRAL GULCH AT 84 RANCH, CO.
                    TEMPERATURE (DEG. C) OF WATER

                    PROVISIONAL DATA FOR WATER YEAR EN

               S  DATE         MAX        MIN      MEAN


               A  10-13        16.8       2.9       7.4   AM
                                                          PM      1
               A  10-14        16.8        .2       6.6   AM
                                                          PM      1
               A  10-15        16.6        .7       6.8   AM
                                                          PM      1

               A  10-16        16.5       1.0       6.8   AM
                                                          PM      1
               A  10-17        15.8       2.8       6.9   AM
                                                          PM      1
               A  10-18        11.3       1.1       5.3   AM
                                                          PM
               A  10-19        13.6       1.7       7.8   AM
                                                          PM      1
               A  10-20        14.5       1.5       7.2   AM
                                                          PM      1

               A  10-21        14.7       1.3       7.4   AM
                                                          PM      1
               A  10-22        14.7       2.4       8.1   AM
                                                          PM      1
               A  10-23        14.3       4.7       8.2   AM
                                                          PM      1
               A  10-24        14.1       3.6       7.7   AM
                                                          PM      1
               A  10-25        11.0       2.9       7.7   AM
                                                          PM      1

               A  10-26        10.9       1.9       6.3   AM
                                                          PM
               A  10-27        12.1       2.5       8.1   AM
                                                          PM      1
               A  10-28        12.0       1.7       7.4   AM
                                                          PM      1
               A  10-29        12.6        .4       5.7   AM
                                                          PM      1
               A  10-30        12.7       2.1       8.1   AM
                                                          PM      1
               A  10-31        13.0       3.0       8.2   AM
                                                          PM      1

               A  11-01        12.8       2.9       8.1   AM
                                                          PM      1
               A  11-02        13.2       3.5       9.0   AM
                                                          PM      1
               A  11-03        11.3       4.0       7.8   AM
                                                          PM      1
               A  11-04        12.7       4.2       9.5   AM
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UNITED STATES DEP
PRIM

09306244
CORRAL GULCH AT 84 RANCH, CO.
TEMPERATURE (DEG. C) OF WATER

PROVISIONAL DATA FOR WATER YEAR

S	DATE	MAX	MIN	MEAN	
					PM
A	11-05	14.4	4.1	9.4	AM
					PM
A	11-06	13.3	3.8	9.6	AM
					PM
A	11-07	14.1	3.9	9.3	AM
					PM
A	11-08	13.9	4.2	9.1	AM
					PM
A	11-09	12.1	3.5	8.7	AM
					PM
A	11-10	12.1	3.4	8.2	AM
					PM
A	11-11	13.1	5.2	9.5	AM
					PM
A	11-12	11.4	5.3	8.8	AM
					PM
A	11-13	10.9	4.6	8.4	AM
					PM
A	11-14	10.0	5.0	7.8	AM
					PM
A	11-15	11.1	3.9	7.1	AM
					PM
A	11-16	10.6	3.0	5.9	AM
					PM
A	11-17	11.6	1.3	7.2	AM
					PM
A	11-18	13.0	4.1	8.3	AM
					PM
A	11-19	14.4	1.8	8.1	AM
					PM
A	11-20	14.2	2.2	7.5	AM
					PM
A	11-21	14.7	3.3	7.8	AM
					PM
A	11-22	11.2	3.4	8.1	AM
					PM
A	11-23	12.7	.6	5.9	AM
					PM
A	11-24	11.6	.7	6.1	AM
					PM
A	11-25	11.7	2.8	6.7	AM
					PM
A	11-26	14.2	1.5	6.8	AM
					PM

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                                   UNITED STATES DEPART
                                                PRIMARY

                    09306244
                    CORRAL GULCH AT 84 RANCH, CO.
                    TEMPERATURE (DEG. C) OF WATER

                    PROVISIONAL DATA FOR WATER YEAR E

S  DATE        MAX       MIN      MEAN

A  11-27       13.1      3.3       8.1  AM
                                        PM
A  11-28       12.8       .4       7.5  AM
                                        PM
A  11-29       15.6      2.1       8.7  AM
                                        PM
A  11-30       10.0      2.7       6.3  AM
                                        PM

A  12-01       16.0      1.9       8.0  AM
                                        PM
A  12-02       13.6      3.6       8.1  AM
                                        PM
A  12-03       13.7      4.0       8.1  AM
                                        PM
A  12-04       12.1      4.8       7.3  AM
                                        PM
A  12-05       16.0      4.4       8.7  AM
                                        PM

A  12-06       14.0      4.4       8.9  AM
                                        PM
A  12-07       11.1      4.8       7.6  AM
                                        PM
A  12-08       11.6      4.2       7.9  AM
                                        PM
A  12-09       12.7      3.6       7.3  AM
                                        PM
A  12-10       13.0      4.8       8.8  AM
                                        PM

A  12-11       14.0      3.7       7.0  AM
                                        PM
A  12-12       10.9      4.0       6.9  AM
                                        PM
A  12-13       12.4      4.0       7.9  AM
                                        PM
A  12-14       13.8      3.7       8.9  AM
                                        PM
A  12-15       14.7      3.9       9.1  AM
                                        PM

A  12-16       12.2      3.8       8.3* AM
                                        PM
   PERIOD      16.8       .2

NOTE.-  SYMBOLS USED ABOVE HAVE THE FOL
        A - SUCCESSIVE RECORDED PUNCH R
        R - ONE OR MORE INPUT VALUE IS
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UNITED STATES DEP
PRIM

09306244
CORRAL GULCH AT 84 RANCH, CO.
TEMPERATURE (DEG. C) OF WATER

PROVISIONAL DATA FOR WATER YEAR

S	DATE	MAX	MIN	MEAN	
A	12-16	5.7	2.7	7.0	AM PM
A	12-17	9.4	1.4	4.9	AM PM
A	12-18	4.1	.9	1.7	AM PM
A	12-19	3.8	1.0	1.7	AM PM
A	12-20	3.2	.8	1.5	AM PM
A	12-21	3.6	1.0	1.5	AM PM
A	12-22	3.8	.9	1.7	AM PM
A	12-23	4.2	.9	2.0	AM PM
A	12-24	5.2	1.5	3.0	AM PM
A	12-25	4.4	1.1	2.0	AM PM
A	12-26	5.5	1.1	2.7	AM PM
A	12-27	5.4	1.6	2.9	AM PM
A	12-28	5.1	1.1	2.5	AM PM
A	12-29	5.2	1.1	2.5	AM PM
	12-30	4.0	1.4	2.3	AM PM
A	12-31	3.0	1.1	1.9	AM PM
A	1-01	3.9	1.5	2.5	AM PM
A	1-02	3.9	1.5	2.4	AM PM
	1-03	3.6	2.5	2.8	AM PM
A	1-04	4.5	2.4	3.1	AM PM
A	1-05	3.7	1.7	2.6	AM PM
	1-06	~~1.9~~	~~1.1~~	~~1.4~~	AM PM

UNITED STATES DEPAR
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09306244
CORRAL GULCH AT 84 RANCH, CO.
TEMPERATURE (DEG. C) OF WATER

PROVISIONAL DATA FOR WATER YEAR E

S	DATE	MAX	MIN	MEAN	
	1-07	1.8	1.1	1.4	AM
					PM
	1-08	3.6	1.5	2.1	AM
					PM
	1-09	1.4	.6	1.3	AM
					PM
	1-10	1.6	1.1	1.3	AM
					PM
	1-11	1.8	1.1	1.4	AM
					PM
	1-12	1.5	1.3	1.4*	AM
					PM
	PERIOD	9.4	.6		

Probe Frozen

NOTE.- SYMBOLS USED ABOVE HAVE THE FOLL
A - SUCCESSIVE RECORDED PUNCH RE
R - ONE OR MORE INPUT VALUE IS O
* - DAILY SUMMARY IS FOR AN INCO
% - UNIT VALUES RECORD WRITTEN

SHIFT
SHIFT
SHIFT
SHIFT
SHIFT

Recorder shut dow

Punch Probes f

Corral @ 34 Ranch

Date	Mean Temp	Mean Cond.
10-06-76		1400
07		1460
8		1550
9		1610
10		1660
11		1720
12		1770
13		1830
14		1820
15		1830
16		1830
17		1840

Conductivity record is being rerun on new rating. Should be available at a latter date.

Temperature and conductivity probes were frozen in, early January.

UNITED STATES DEPA

PRIMAF

09306244
CORRAL GULCH AT 84 RANCH, CO.
TEMPERATURE (DEG. C) OF WATER

PROVISIONAL DATA FOR WATER YEAR

S	DATE	MAX	MIN	MEAN	
A	5-17	23.4	5.8	10.8	AM PM
A	5-18	23.9	1.1	9.9	AM PM
A	5-19	21.4	-.1	9.5	AM PM
A	5-20	20.6	.7	8.8	AM PM
A	5-21	26.4	.2	11.0	AM PM
A	5-22	26.9	.9	11.6	AM PM
A	5-23	20.5	2.0	10.2	AM PM
A	5-24	19.9	1.6	9.7	AM PM
A	5-25	23.6	5.1	11.7	AM PM
A	5-26	22.6	3.3	10.1	AM PM
A	5-27	19.3	3.2	9.7	AM PM
A	5-28	20.5	3.9	10.2	AM PM
A	5-29	27.3	.7	12.4	AM PM
A	5-30	30.4	3.3	15.1	AM PM
A	5-31	32.6	1.6	15.4	AM PM
A	6-01	25.1	2.6	13.7	AM PM
A	6-02	29.2	5.4	14.9	AM PM
A	6-03	29.5	3.9	15.8	AM PM
A	6-04	34.2	3.9	17.8	AM PM
A	6-05	32.8	5.1	17.5	AM PM
A	6-06	28.1	5.9	16.3	AM PM
A	6-07	27.4	6.3	16.1	M M
A	6-08	25.9	7.8	[illegible]	

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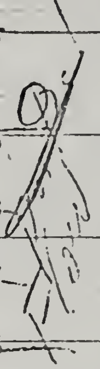
UNITED STATES DEI
PRI

09306244
CORRAL GULCH AT 84 RANCH, CO.
TEMPERATURE (DEG. C) OF WATER

PROVISIONAL DATA FOR WATER YEAR

partial flood



S	DATE	MAX	MIN	MEAN	
					PM
A	6-09	29.4	10.0	17.8	AM
					PM
A	6-10	31.5	9.1	19.1	AM
					PM
A	6-11	31.5	5.8	18.1	AM
					PM
A	6-12	35.3	4.9	18.3	AM
					PM
A	6-13	36.7	4.9	18.5	AM
					PM
A	6-14	38.5	5.0	18.6	AM
					PM
A	6-15	39.3	5.5	18.5	AM
					PM
A	6-16	29.5	5.8	14.1*	AM
					PM
	PERIOD	39.3 -	.1		

NOTE.- SYMBOLS USED ABOVE HAVE THE F
A - SUCCESSIVE RECORDED PUNCH
R - ONE OR MORE INPUT VALUE I
* - DAILY SUMMARY IS FOR AN I
% - UNIT VALUES RECORD WRITTE

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EXPLANATION SHEET

U.S.G.S. MEAN TEMPERATURE
AND
MEAN CONDUCTIVITY
COMPUTER PRINTOUT SHEET

Column	Label	Description
1	MO	Month
2	DA	Day
3	YR	Year
4	PAR	Parameter: Label #1 indicates values for specific conductance; #2 indicates values for temperature.
5	0600	Value of parameter for quarter day times values.
6	1200	
7	1800	
8	2400	
9	MAX	Maximum value recorded for the day.
10	MIN	Minimum value recorded for the day.
11	MEAN	Mean value recorded for the day.

[illegible] PUNCH

PRELIMINARY DATA SUBJECT TO REVISION

ING ENTERED FOR PARAM. 1 IS C.-2 CONDUCTIVITY RATING
ING ENTERED FOR PARAM. 2 IS C? TEMPERATURE RATING

MO	DA	YR	PARAMETER	0600	1200	1800	2400	MAX	MIN	MEAN
4	5	77	1	0	[illegible] 1725	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	5	77	2	0.0	0.0	12.8	[illegible]	14.7	0.4	5.2
4	6	77	1	1494	1430	1518	1753	1796	1148	1561
4	6	77	2	0.7	7.1	17.4	5.2	21.0	0.3	7.8
4	7	77	1	1733	1728	1647	1751	1742	1607	1710
4	7	77	2	1.2	8.3	18.0	4.0	20.3	-0.5	8.2
4	8	77	1	1720	1704	1667	1.22	1747	161_	1703
4	8	77	2	1.3	8.5	15.8	[illegible]	19.3	0.7	7.6
4	9	77	1	1715	1 03	[illegible]	1729	176.	1567	1698
4	9	77	2	1.0	8.2	17.0	4.8	20.5	-0.5	7.6
4	10	77	1	1701	1706	1673	1737	1743	1603	1703
4	10	77	2	0.9	7.8	16.0	2.1	20.3	-1.5	6.8
4	11	77	1	1707	1705	1647	1723	1727	1615	1696
4	11	77	2	1.7	[illegible]	11.4	[illegible]	15.	[illegible]	5.1
4	12	77	1	1681	1643	1659	[illegible]	1710	[illegible]	[illegible]
4	12	77	2	-1.1	5.4	7.6	[illegible]	13.4	-1.4	3.5
4	13	77	1	1663	1607	[illegible]	[illegible]	1709	[illegible]	1654
4	13	77	2	0.9	[illegible]	[illegible]	[illegible]	17.7	[illegible]	[illegible]
4	14	77	1	1632	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1671
4	14	77	2	0.5	[illegible]	16.2	3.6	20.0	[illegible]	[illegible]
4	15	77	1	1575	1648	[illegible]	1676	[illegible]	[illegible]	1650
4	15	77	2	[illegible]	[illegible]	[illegible]	1.1	[illegible]	[illegible]	[illegible]
4	16	77	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	16	77	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-1.1	[illegible]
4	17	77	1	1676	[illegible]	1618	[illegible]	[illegible]	[illegible]	[illegible]
4	17	77	2	1.5	[illegible]	15.3	[illegible]	[illegible]	[illegible]	4.0
4	18	77	1	1641	[illegible]	1616	[illegible]	[illegible]	[illegible]	[illegible]
4	18	77	2	2.7	8.5	16.9	4.9	[illegible]	-0.5	8.5
4	19	77	1	1627	[illegible]	[illegible]	1632	1646	1596	1612
4	19	77	2	1.4	[illegible]	[illegible]	2.4	7.3	[illegible]	3.1
4	20	77	1	1632	1620	1592	1630	1642	[illegible]	[illegible]
4	20	77	2	1.5	8.0	16.0	4.0	20.2	-0.4	7.5
4	21	77	1	1650	1610	1627	1645	1664	1571	1640
4	21	77	2	0.7	[illegible]	[illegible]	5.8	22.2	0.3	9.0
4	22	77	1	1653	1640	[illegible]	1654	1665	1602	1640
4	22	77	2	1.2	7.0	20.1	6.4	22.2	0.1	8.9
4	23	77	1	1659	1662	1661	[illegible]	1682	1630	1665
4	23	77	2	[illegible]	6.8	20.6	6.6	22.9	-0.6	9.1
4	24	77	1	1655	1664	1663	1672	1692	1613	1664
4	24	77	2	2.5	9.7	21.9	6.2	22.3	-0.5	10.2
4	25	77	1	1669	1672	1676	1685	1717	1627	1676
4	25	77	2	2.4	10.2	20.8	6.4	23.2	-0.5	10.1
4	26	77	1	1667	1666	1654	1705	1726	1602	1677
4	26	77	2	2.9	10.6	19.1	7.7	22.2	0.3	[illegible]
4	27	77	1	1670	1632	1600	1669	1711	[illegible]	[illegible]
4	27	77	2	3.0	9.6	[illegible]	7.9	19.4	[illegible]	[illegible]
4	28	77	1	1707	1677	1675	[illegible]	1720	[illegible]	[illegible]
4	28	77	2	1.9	9.9	11.9	[illegible]	17.7	[illegible]	[illegible]
4	29	77	1	1732	1761	1712	1731	[illegible]	[illegible]	1711
4	29	77	2	0.3	11.4	16.1	6.5	[illegible]	[illegible]	[illegible]
4	30	77	1	1749	1754	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	30	77	2	[illegible]	11.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	1	77	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	1	77	2	1.3	9.5	16.4	[illegible]	19.1	[illegible]	[illegible]
5	2	77	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	2	77	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	3	77	1	1710	1720	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	3	77	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	4	77	1	1781	1765	1779	1741	[illegible]	1704	[illegible]
5	4	77	2	2.1	10.1	17.5	7.2	[illegible]	-0.1	[illegible]
5	5	77	1	1748	1708	0	1772	1824	1664	1744
5	5	77	2	1.6	10.5	17.8	8.4	22.1	-0.5	9.9
5	6	77	1	1760	1759	[illegible]	1831	1757	1231	1771
5	6	77	2	2.5	9.6	19.1	6.1	22.1	-0.5	9.6
5	7	77	1	1779	1779	1742	1787	1802	1709	1771
5	7	77	2	1.6	10.0	21.3	5.4	22.2	-0.2	9.7
5	8	77	1	1772	1731	[illegible]	1776	1814	1148	1731
5	8	77	2	2.1	10.5	[illegible]	5.8	22.5	[illegible]	[illegible]
5	9	77	1	1767	1789	[illegible]	1759	[illegible]	[illegible]	[illegible]
5	9	77	2	2.6	11.2	19.7	7.4	[illegible]	[illegible]	10.4
5	10	77	1	1771	1779	[illegible]	1759	[illegible]	[illegible]	[illegible]
5	10	77	2	1.0	5.9	[illegible]	4.5	[illegible]	[illegible]	[illegible]
5	11	77	1	1736	1743	1495	[illegible]	[illegible]	[illegible]	[illegible]
5	11	77	2	0.1	[illegible]	16.4	[illegible]	[illegible]	[illegible]	[illegible]
5	12	77	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	12	77	2	[illegible]	4.3	18.3	6.3	[illegible]	[illegible]	[illegible]
5	13	77	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	13	77	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-0.4	[illegible]
5	14	77	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	14	77	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	15	77	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	15	77	2	0.7	10.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	16	77	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	16	77	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	PHENOLS (UG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS_SOLVED AMMONIA (NH4) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE MSL)	DIS-SOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUS-PENDED GROSS ALPHA AS U-NAT. (UG/L)	DIS-SOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUS-PENDED GROSS BETA AS SR90 /Y90 (PC/L)
OCT 13...	--	1290	.07	1.75	.01	--	--	6366	--	--	--	--
FEB 23...	--	1300	.28	1.77	.06	--	--	6366	--	--	--	--
MAR 17...	--	1170	.16	1.59	.01	--	--	6366	--	--	--	--
APR 19...	0	1290	.24	1.75	.05	.0	.0	6366	<14	<.4	7.1	<.4

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WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	ATMOS-PHERIC ODOR (SEVER-ITY)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L)	SUS-PENDED GROSS BETA AS CS-137 (PC/L)	DIS-SOLVED RA-226 (RADON METHOD) (PC/L)	DIS-SOLVED NATURAL URANIUM (U) (UG/L)
OCT												
13...	--	--	--	--	--	--	--	1	--	--	--	--
FEB												
23...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
17...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
19...	100	40	2700	20	20	10	2	--	8.7	<.4	.11	5.6

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WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)
OCT												
13...	2.3	20	580	.3	22	--	200	--	--	--	--	--
FEB												
23...	3.0	18	560	.3	19	--	180	--	--	--	--	--
MAR												
17...	2.8	15	480	.4	16	--	170	--	--	--	--	--
APR												
19...	2.3	21	550	.4	17	2	150	1	0	1	100	3

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WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOL-VED ORGANIC CARBON (C) (MG/L)	SUS-PENDED ORGANIC CARBON (C) (MG/L)	CYANIDE (CN) (MG/L)	DIS-SOL-VED SUL-FIDE (S) (MG/L)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM AD-SORP-TION RATIO	PERCENT SODIUM
OCT												
13...	.02	6.7	.1	--	--	730	300	110	110	190	3.1	36
FEB												
23...	.03	9.9	1.0	--	--	700	180	100	110	180	3.0	36
MAR												
17...	.05	8.9	.7	--	--	650	170	99	98	170	2.9	36
APR												
19...	.04	13	.8	.00	.6	710	200	100	110	180	3.0	36

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WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	TOTAL FILT- RABLE RESIDUE (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	OIL AND GREASE (MG/L)	DIS- SOLVED ORGANIC NITRO- GEN (N) (MG/L)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L)	DIS- SOLVED KJEL. NITRO- GEN (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	PHOS- PHATE (PO4) (MG/L)	DIS- SOLVED ORTHO PHOS- PHATE (PO4) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)
OCT												
13...	518	0	--	--	--	.28	.01	.29	.02	.03	.06	.01
FEB												
23...	633	0	--	--	--	.41	.05	.46	.21	.06	.09	.02
MAR												
17...	588	0	--	--	--	.73	.01	.74	.09	.18	.15	.06
APR												
19...	620	0	1400	<1	0	.37	.04	.41	.24	.06	.12	.02

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WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TEMPER-ATURE (DEG C)	WEATHER	INSTAN-TANEOUS DIS-CHARGE (CFS)	TUR-BID-ITY (NTU)	COLOR (PLAT-INUM-COBALT UNITS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	DIS-SOLVED OXYGEN (MG/L)	CHEM-ICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L)	PH (UNITS)	CARBON DIOXIDE (CO2) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)
OCT												
13...	1005	7.5	0	.02	0	4	1850	12.7	--	8.4	3.3	425
FEB												
23...	1450	8.5	--	.08	--	12	1800	8.5	--	8.6	2.5	519
MAR												
17...	1400	6.0	--	.05	--	25	1520	12.3	--	8.3	4.7	480
APR												
19...	1025	7.0	--	.07	--	6	1780	12.0	22	8.2	6.3	510

09306230 STAKE SPRINGS DRAW NEAR RANGELY, COLO.

LOCATION.--Lat 39°55'37", long 108°25'14", in NW¼NW¼ sec.32, T.1 S., R.98 W., Rio Blanco County, at gaging station, on left bank 0.4 mi (0.6 km) upstream from confluence with Corral Gulch and 22 mi (35 km) southeast of Rangely.

DRAINAGE AREA.--26.1 mi^2 (67.6 km^2).

PERIOD OF RECORD.--Chemical analyses: April 1974 to current year.

REMARKS.--No flow during period of record.

09306235 CORRAL GULCH BELOW WATER GULCH, NEAR RANGELY, COLO.

LOCATION.--Lat 39°51'22", long 108°31'56", in SE¼NW¼ sec.5, T.2 S., R.99 W., Rio Blanco County, at gaging station, on left bank 0.1 mi (0.2 km) downstream from Water Gulch and 19 mi (31 km) southeast of Rangely.

DRAINAGE AREA.--8.61 mi² (22.30 km²).

PERIOD OF RECORD.--Chemical analyses: March 1974 to current year.
Specific conductance: April to September 1975.
Water temperatures: April to September 1975.
Sediment records: October 1974 to September 1975.

EXTREMES, 1975.--Sediment concentrations: Maximum daily, 4,000 mg/L June 8; no flow on many days during December to March.
Sediment loads: 6.9 tons (6.3 t) June 8; no flow on many days during December to March.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)
OCT.												
03...	1400	--	--	90	0	72	55	89	.6	382	0	313
09...	1245	--	21	100	10	68	54	89	.9	365	0	299
16...	1020	--	21	20	0	88	54	89	1.4	379	0	311
24...	1245	--	22	20	0	81	50	86	1.5	372	0	305
NOV.												
01...	1230	.30	21	50	0	86	53	88	1.5	390	0	320
13...	1330	.19	19	30	0	78	58	90	.7	387	0	317
JAN.												
08...	1015	--	19	10	50	92	67	120	1.6	513	0	421
APR.												
09...	1400	.04	19	50	0	85	60	86	1.6	395	0	324
23...	1400	.03	20	20	0	75	59	90	1.5	367	0	301
MAY												
14...	1045	.02	18	20	0	76	56	91	1.5	355	0	291
28...	1100	.10	19	80	20	90	58	75	1.4	393	0	322
JUNE												
11...	1130	--	23	55	4	84	61	49	1.1	388	0	318
24...	1100	.18	22	10	0	80	60	80	1.0	372	0	305
JULY												
15...	1100	.10	21	30	0	84	60	87	1.5	380	0	312
30...	1330	.24	23	10	10	82	66	87	1.5	384	0	315
AUG.												
12...	1300	.47	22	20	0	87	58	84	1.6	425	0	349
26...	1215	.49	22	50	10	89	60	86	1.3	408	0	335
SEP.												
08...	1125	.27	21	34	<5	90	60	85	1.2	416	0	341
24...	1105	.44	21	40	10	93	61	89	1.1	407	0	334

09306235 CORRAL GULCH BELOW WATER GULCH, NEAR RANGELY, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

TE	DIS- SOL- VED SUL- FIDE (S) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED NITRITE (N) (MG/L)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)	TOTAL ORTHO PHOS- PHORUS (P) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)
.												
...	--	290	7.8	.0	--	--	--	--	--	--	.00	--
...	--	260	8.1	.2	--	--	--	--	--	--	.01	684
...	--	280	7.2	.2	--	--	--	--	--	--	.00	731
...	--	290	7.5	.3	--	--	--	--	--	--	.00	725
V.												
...	--	270	7.5	.2	--	--	--	--	--	--	.01	723
...	--	280	7.3	.2	--	--	--	--	--	--	.00	728
.												
B...	.1	310	9.5	.3	.27	.00	.01	.31	.05	.10	.00	874
R.												
...	.2	270	7.8	.2	.98	.00	.09	4.2	.45	1.3	.02	729
...	.0	280	9.2	.2	.63	.01	.00	.36	.01	.06	.02	719
4...	.0	290	8.9	.2	.50	.00	.03	.30	.04	.03	.02	719
8...	.0	260	6.8	.3	1.0	.00	.00	1.0	.01	.07	.02	709
E												
...	.1	240	5.9	.3	1.5	.01	.00	.89	.01	.20	.00	664
...	.0	260	7.0	.3	1.2	.00	.04	.25	.02	.01	.01	699
LY												
5...	.0	280	8.3	.3	.90	.01	.03	.65	.01	.03	.02	734
...	.0	300	6.9	.3	.84	.01	.00	1.0	.02	.06	.01	760
.												
...	.2	280	8.2	.2	.82	.01	.00	.47	.03	.07	.00	755
6...	.2	280	7.6	.3	.91	.01	.00	.52	.00	.02	.00	752
P.												
...	.3	280	7.5	.3	.85	.01	.00	.43	.01	.07	.00	757
...	.0	290	7.3	.3	.77	.01	.01	.64	.01	.05	.01	767

TE	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	SODIUM AD- SORP- TION RATIO	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	CYANIDE (CN) (MG/L)	OIL AND GREASE (MG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)
CT.												
03...	410	97	1.9	1070	8.3	12.5	--	--	10.0	--	--	1
...	390	91	2.0	1050	8.3	16.5	--	--	10.2	--	--	6
...	440	130	1.8	1080	8.1	7.0	--	--	9.7	--	--	8
...	410	110	1.9	1070	8.1	16.0	--	--	9.0	--	--	4
OV.												
01...	430	110	1.8	1090	7.9	7.5	--	--	--	--	--	5
...	430	110	1.9	1090	7.7	6.0	--	--	9.8	--	--	6
.												
...	510	85	2.3	1150	8.1	5.0	3	2	--	.00	9	4
PR.												
09...	460	140	1.7	1080	8.5	2.0	9	450	--	.00	3	4
...	430	130	1.9	1100	8.4	21.0	3	15	7.0	.01	--	5
...	420	130	1.9	1100	7.7	20.0	10	18	8.7	.01	0	4
28...	460	140	1.5	900	7.3	9.0	7	75	9.1	.00	2	9
UNE												
...	460	140	1.0	1050	8.1	19.0	8	120	5.6	.00	1	4
...	450	140	1.6	1100	8.7	18.0	8	13	6.4	.01	3	4
LY												
15...	460	150	1.8	1200	8.4	22.0	15	17	7.0	.00	4	4
30...	480	160	1.7	1120	8.3	26.5	9	34	9.2	.00	1	4
.												
...	460	110	1.7	925	8.5	21.0	15	36	7.2	.00	1	4
...	470	130	1.7	1150	8.1	22.5	17	33	--	.00	0	4
EP.												
08...	470	130	1.7	1050	8.2	12.0	4	2	9.0	.00	1	6
...	480	150	1.8	1100	8.3	13.5	4	20	9.8	.00	0	4

09306235 CORRAL GULCH BELOW WATER GULCH, NEAR RANGELY, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

TE	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
.										
...	0	100	<1	--	2	0	.0	0	4	110
...	0	110	<1	--	3	--	.1	0	3	--
...	<100	70	0	--	2	6	.0	0	3	80
...	0	130	0	--	3	3	.0	10	6	10
.										
...	<100	60	0	--	1	2	.0	20	4	30
...	0	90	0	--	1	0	.1	0	3	10
.										
...	<100	120	0	0	1	3	1.2	10	3	10
.										
...	<100	90	0	0	8	0	1.0	20	4	20
...	0	100	1	0	3	3	.0	10	4	0
...	100	90	0	0	2	1	.0	20	4	10
3...	0	90	0	0	1	2	.0	20	5	0
NE										
1...	120	110	0	<5	2	<5	.0	20	3	10
...	0	100	0	0	4	2	.0	20	5	6
Y										
...	200	80	0	0	0	0	.0	10	4	0
0...	0	110	1	0	2	0	.0	20	4	20
S.										
2...	<100	90	0	0	4	1	.0	20	5	10
6...	<200	100	0	10	1	0	.0	20	3	10
P.										
8...	57	60	0	<5	4	<5	.0	20	3	10
4...	<200	100	0	10	1	1	.0	20	3	10

DATE	TIME	TEMPER-ATURE (DEG C)	INSTAN-TANEOUS DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
MAR						
02...	1730	--	.52	705	.99	99
APR						
09...	1400	2.0	.04	146	.02	95
MAY						
14...	1045	20.0	.02	247	.01	68
JUN						
09...	1440	21.0	.57	2840	4.4	38
11...	1130	19.0	.64	931	1.7	55
24...	1100	18.0	.18	122	.06	68

09306235 CORRAL GULCH BELOW WATER GULCH, NEAR RANGELY, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TOTAL ALUMINUM (AL) (UG/L)	DISSOLVED ALUMINUM (AL) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL FILTRABLE RESIDUE (MG/L)	TOTAL NONFILTRABLE RESIDUE (MG/L)	CHEMICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	DISSOLVED ORGANIC CARBON (C) (MG/L)	SUSPENDED ORGANIC CARBON (C) (MG/L)	TOTAL BARIUM (BA) (UG/L)	TOTAL BERYLLIUM (BE) (UG/L)
JUNE 11...	20000	35	12000	350	--	--	20	44	12	1.2	400	<4
SEP. 08...	--	40	--	--	660	82	16	8.0	--	--	--	--

DATE	DISSOLVED BERYLLIUM (BE) (UG/L)	TOTAL BISMUTH (BI) (UG/L)	DISSOLVED BISMUTH (BI) (UG/L)	TOTAL BORON (B) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DISSOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL GALLIUM (GA) (UG/L)	DISSOLVED GALLIUM (GA) (UG/L)	TOTAL GERMANIUM (GE) (UG/L)
JUNE 11...	<2	<8	<5	120	0	20	8	<5	8	<4	<2	<10
SEP. 08...	<1	--	<5	--	--	--	--	<3	--	--	<3	--

DATE	DISSOLVED GERMANIUM (GE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL LITHIUM (LI) (UG/L)	TOTAL MOLYBDENUM (MO) (UG/L)	DISSOLVED MOLYBDENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)	DISSOLVED NICKEL (NI) (UG/L)	TOTAL SILVER (AG) (UG/L)	DISSOLVED SILVER (AG) (UG/L)	TOTAL STRONTIUM (SR) (UG/L)	DISSOLVED STRONTIUM (SR) (UG/L)	TOTAL TIN (SN) (UG/L)
JUNE 11...	<7	8	40	45	45	40	<5	<1	0	1300	1200	<8
SEP. 08...	<5	--	--	--	46	--	<5	--	0	--	1400	--

DATE	DISSOLVED TIN (SN) (UG/L)	TOTAL TITANIUM (TI) (UG/L)	DISSOLVED TITANIUM (TI) (UG/L)	TOTAL VANADIUM (V) (UG/L)	DISSOLVED VANADIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ZIRCONIUM (ZR) (UG/L)	DISSOLVED ZIRCONIUM (ZR) (UG/L)	DISSOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUSPENDED GROSS ALPHA AS U-NAT. (UG/L)	DISSOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUSPENDED GROSS BETA AS SR90 /Y90 (PC/L)
JUNE 11...	<7	1200	<3	33	7.0	20	50	<7	--	--	--	--
SEP. 08...	<5	--	<3	--	<3.0	--	--	<10	<8.9	<.8	26	<.5

DATE	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)
JUNE 11...	.00	.0	.00	.00	.00	.00	.00	.00	.00	.00
SEP. 08...	.00	.0	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL PCB (UG/L)	TOTAL SILVEX (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)
JUNE 11...	.00	.00	.00	.00	.0	.00	0	.00	.00
SEP. 08...	.00	.00	.00	.00	.0	.00	0	.00	.00

09306235 CORRAL GULCH BELOW WATER GULCH, NEAR RIO BLANCO, COLO.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							---	---	---	1050	1330	1230
2							---	---	---	1040	---	1260
3							---	---	---	1060	---	1270
4							1070	---	---	1060	---	1300
5							1080	---	---	1080	---	1290
6							1100	---	---	1080	---	1270
7							1080	---	---	1080	---	1210
8							1080	---	---	1080	---	---
9							1080	---	---	1050	---	---
10							1090	---	---	1040	---	---
11							1100	---	1050	1080	---	1100
12							1100	---	---	1110	---	1150
13							1100	---	---	1140	910	1100
14							1100	1300	---	1170	920	1110
15							1100	---	---	1210	930	1080
16							1100	---	---	1180	950	1060
17							1080	---	---	1200	970	1060
18							1060	---	---	1220	980	1030
19							1070	---	---	1240	990	1030
20							1070	---	---	1260	1010	1020
21							1080	---	---	1260	1050	1010
22							1060	---	---	1220	1060	1040
23							---	---	---	1190	1080	1130
24							---	---	1100	1150	1100	1140
25							---	---	---	1160	1110	1110
26							---	---	1040	1140	1140	1110
27							---	---	1110	1110	1160	1090
28							---	900	1040	1110	1170	1070
29							---	---	1060	1110	1160	1050
30							---	---	1030	1120	1230	1040
31							---	---	---	1110	1240	---
MONTH							---	---	---	1130	---	1120

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	---	---	---		31.5	9.0	29.0	6.0	28.0	9.0	23.5	5.5
2	---	---	---		31.5	10.0	32.0	7.5	28.5	7.0	23.5	6.0
3	4.5	---	---		25.5	10.5	31.5	9.0	28.0	7.0	24.0	4.0
4	8.0	---	---		30.0	12.0	31.0	9.0	26.0	9.0	22.5	5.5
5	9.5	---	---		34.5	10.0	30.5	9.0	26.5	7.0	23.0	4.0
6	10.5	---	---		33.0	11.5	32.0	9.0	22.5	10.5	23.5	4.0
7	5.5	---	---		23.0	13.5	32.0	9.5	27.5	10.5	24.0	5.0
8	6.0	---	---		22.0	12.0	33.0	11.5	27.5	8.0	15.5	7.5
9	6.0	0.0	---		21.5	9.0	32.0	14.0	27.5	8.5	20.0	8.0
10	8.5	---	---		15.5	9.5	33.5	12.5	27.0	9.0	19.5	8.0
11	10.0	---	---		29.0	8.0	---	11.5	24.5	11.5	14.0	6.5
12	10.0	---	---		27.0	10.0	27.0	11.0	25.0	9.0	21.5	6.5
13	12.5	---	---		32.5	11.5	30.5	12.0	22.5	10.5	18.5	7.5
14	12.0	---	---		33.0	13.5	32.0	12.0	21.5	10.0	21.5	6.0
15	10.0	2.0	---		33.0	10.5	31.5	12.5	26.0	8.0	22.5	5.5
16	12.5	1.5	---		24.5	13.5	22.0	13.5	24.5	10.0	19.0	6.5
17	8.5	---	---		21.0	13.0	28.0	16.0	28.0	9.5	21.0	6.0
18	11.5	---	---		18.5	9.5	29.5	11.5	29.5	12.5	19.0	5.0
19	12.5	---	---		22.5	8.0	32.0	11.0	30.0	13.0	19.0	2.0
20	12.0	---	---		20.0	8.5	26.0	12.5	27.5	13.0	16.5	2.0
21	17.0	---	---		20.5	8.0	32.5	11.0	30.0	14.5	17.5	1.0
22	15.0	---	---		28.5	9.0	30.5	9.5	31.5	11.0	19.5	1.5
23	---	---	---		31.0	9.5	31.5	10.0	28.0	9.5	20.5	2.5
24	---	---	---		---	10.0	30.5	10.0	25.5	8.0	20.5	2.5
25	---	---	---		21.0	12.5	30.0	9.0	24.5	7.0	19.5	2.5
26	---	---	---		26.5	2.0	28.5	8.5	29.0	8.5	18.5	4.0
27	---	---	---		26.5	4.5	28.5	9.0	16.5	7.5	19.0	3.0
28	---	---	---		28.0	5.0	---	10.5	23.5	5.0	19.0	2.0
29	---	---	20.0		28.0	5.0	26.5	10.5	23.5	6.5	18.5	3.0
30	---	---	32.0		30.0	5.5	27.5	10.0	24.0	4.5	17.0	2.0
31	---	---	25.5		---	---	---	9.5	23.0	4.0	---	---
MONTH	---	---	---		34.5	2.0	33.5	6.0	31.5	4.0	24.0	1.0

09306235 CORRAL GULCH BELOW WATER GULCH, NEAR RANGELY, COLO.--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	OCTOBER			NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.22	120	.07	.20	90	.05	.04	2	0
2	.20	90	.05	.20	90	.05	.03	1	0
3	.20	90	.05	.20	90	.05	.03	1	0
4	.20	90	.05	.20	90	.05	.02	1	0
5	.20	90	.05	.19	70	.04	.02	1	0
6	.20	90	.05	.18	60	.03	.02	1	0
7	.20	90	.05	.18	60	.03	.01	1	0
8	.20	90	.05	.18	60	.03	.01	1	0
9	.19	70	.04	.18	60	.03	.01	1	0
10	.19	70	.04	.18	60	.03	0	---	---
11	.19	70	.04	.18	60	.03	0	---	---
12	.20	90	.05	.18	60	.03	0	---	---
13	.20	90	.05	.16	40	.02	0	---	---
14	.20	90	.05	.16	40	.02	0	---	---
15	.20	90	.05	.16	40	.02	0	---	---
16	.18	60	.03	.16	40	.02	0	---	---
17	.18	60	.03	.16	40	.02	0	---	---
18	.18	60	.03	.16	40	.02	0	---	---
19	.18	60	.03	.16	40	.02	0	---	---
20	.18	60	.03	.18	60	.03	0	---	---
21	.18	60	.03	.16	40	.02	0	---	---
22	.18	60	.03	.16	40	.02	0	---	---
23	.18	60	.03	.16	40	.02	0	---	---
24	.20	90	.05	.15	30	.01	0	---	---
25	.18	60	.03	.13	12	0	0	---	---
26	.18	60	.03	.11	8	0	0	---	---
27	.18	60	.03	.10	5	0	0	---	---
28	.19	70	.04	.08	4	0	0	---	---
29	.20	90	.05	.06	3	0	0	---	---
30	.20	90	.05	.05	2	0	0	---	---
31	.20	90	.05	---	---	---	0	---	---

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1							0	---	---
2							0	---	---
3							0	---	---
4							0	---	---
5							0	---	---
6							0	---	---
7							0	---	---
8							0	---	---
9							0	---	---
10							0	---	---
11							0	---	---
12							0	---	---
13							.04	2	0
14							.04	2	0
15							.04	2	0
16							.01	1	0
17							.01	1	0
18							.01	1	0
19							.02	1	0
20							0	---	---
21							0	---	---
22							0	---	---
23							0	---	---
24							0	---	---
25							0	---	---
26							0	---	---
27							0	---	---
28							0	---	---
29							.01	1	0
30							.02	1	0
31							.01	1	0

09306235 CORRAL GULCH BELOW WATER GULCH, NEAR RIO BLANCO, COLO.--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	APRIL			MAY			JUNE		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	0	---	---	.03	1	0	.14	25	.01
2	0	---	---	.04	2	0	.22	120	.07
3	.05	2	0	.02	1	0	.32	440	.38
4	.01	1	0	.01	1	0	.38	750	.77
5	.02	1	0	.05	2	0	.41	950	1.1
6	.03	1	0	.03	1	0	.38	750	.77
7	.04	2	0	.04	2	0	.60	3200	5.2
8	.02	1	0	.03	1	0	.64	4000	6.9
9	.01	1	0	.03	1	0	.60	3200	5.2
10	.01	1	0	.02	1	0	.60	3200	5.2
11	.02	1	0	.02	1	0	.44	1200	1.4
12	.02	1	0	.03	1	0	.47	1450	1.8
13	.01	1	0	.02	1	0	.38	750	.77
14	.03	1	0	.01	1	0	.44	1200	1.4
15	.05	2	0	.02	1	0	.41	950	1.1
16	.06	3	0	.02	1	0	.41	950	1.1
17	.05	2	0	.01	1	0	.41	950	1.1
18	.03	1	0	.02	1	0	.41	950	1.1
19	.03	1	0	.01	1	0	.38	750	.77
20	.04	2	0	.02	1	0	.38	750	.77
21	.04	2	0	.04	2	0	.35	600	.57
22	.04	2	0	.02	1	0	.28	290	.22
23	.03	1	0	.02	1	0	.22	120	.07
24	.04	2	0	.01	1	0	.20	90	.05
25	.03	1	0	.01	1	0	.20	90	.05
26	.03	1	0	.01	1	0	.20	90	.05
27	.04	2	0	.02	1	0	.20	90	.05
28	.03	1	0	.07	4	0	.20	90	.05
29	.02	1	0	.08	4	0	.18	60	.03
30	.04	2	0	.07	4	0	.20	90	.05
31	---	---	---	.10	5	0	---	---	---

	JULY			AUGUST			SEPTEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.22	120	.07	.22	120	.07	.47	90	.11
2	.22	120	.07	.24	170	.11	.44	60	.07
3	.22	120	.07	.24	170	.11	.44	60	.07
4	.22	120	.07	.30	350	.28	.38	35	.04
5	.22	120	.07	.41	50	.06	.35	22	.02
6	.22	120	.07	.44	60	.07	.32	15	.01
7	.20	90	.05	.44	60	.07	.30	12	.01
8	.18	60	.03	.44	60	.07	.35	22	.02
9	.22	120	.07	.43	55	.06	.38	35	.04
10	.16	40	.02	.42	50	.06	.47	90	.11
11	.14	25	.01	.41	50	.06	.50	115	.16
12	.12	10	0	.41	50	.06	.50	115	.16
13	.12	10	0	.41	50	.06	.50	115	.16
14	.10	5	0	.44	60	.07	.50	115	.16
15	.10	5	0	.47	90	.11	.50	115	.16
16	.14	25	.01	.44	60	.07	.50	115	.16
17	.14	25	.01	.41	50	.06	.50	115	.16
18	.12	10	0	.41	50	.06	.50	115	.16
19	.10	5	0	.44	60	.07	.47	90	.11
20	.14	25	.01	.47	90	.11	.41	50	.06
21	.14	25	.01	.47	90	.11	.41	50	.06
22	.14	25	.01	.50	115	.16	.38	35	.04
23	.16	40	.02	.50	115	.16	.38	35	.04
24	.16	40	.02	.50	115	.16	.35	22	.02
25	.18	60	.03	.50	115	.16	.38	35	.04
26	.20	90	.05	.50	115	.16	.38	35	.04
27	.20	90	.05	.53	140	.20	.38	35	.04
28	.22	120	.07	.53	140	.20	.38	35	.04
29	.22	120	.07	.53	140	.20	.38	35	.04
30	.24	170	.11	.50	115	.16	.38	35	.04
31	.24	170	.11	.47	90	.11	---	---	---

09306240 BOX ELDER GULCH NEAR RANGELY, COLO.

LOCATION.--Lat 39°53'18", long 108°31'40", in NE¼SW¼ sec.8, T.2 S., R.99 W., Rio Blanco County, at gaging station, on left bank 30 ft (9 m) upstream from unnamed tributary, 4.1 mi (6.6 km) upstream from mouth, and 20 mi (32 km) southeast of Rangely.

DRAINAGE AREA.--9.21 mi² (23.85 km²).

PERIOD OF RECORD.--Chemical analyses: April 1974 to current year.
Sediment records: March to September 1975.

EXTREMES, 1975.--Sediment concentrations: Maximum daily, 2,940 mg/L May 22; no flow many days during year.
Sediment loads: Maximum daily, 21 tons (19 t) May 22; no flow many days during year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)
AY												
14...	1545	.55	23	20	5	57	47	56	1.5	313	0	257
28...	1450	--	21	40	20	75	46	49	1.0	354	0	290
UNE												
16...	1230	--	22	8	<4	62	47	39	.7	326	0	267
25...	1110	.49	22	0	5	64	44	55	.7	334	0	274

DATE	DISSOLVED SULFIDE (S) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	HARDNESS (CA,MG) (MG/L)
MAY												
14...	.0	170	6.0	.3	.92	.00	.01	.37	.12	.02	520	340
28...	.2	150	5.2	.4	1.0	.00	.00	2.7	.41	.03	527	380
UNE												
16...	.2	140	5.2	.3	.92	.01	.00	.66	.03	.01	432	350
25...	.0	160	6.0	.3	.88	.01	.00	.31	.03	.01	521	340

DATE	NONCARBONATE HARDNESS (MG/L)	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	CHEMICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L)	CYANIDE (CN) (MG/L)	OIL AND GREASE (MG/L)
MAY											
14...	79	1.3	645	8.5	27.5	9	50	5.5	--	.01	2
28...	86	1.1	880	--	8.5	2	210	8.5	--	.00	1
JUNE											
16...	82	.9	800	9.0	19.0	17	32	8.3	22	.00	2
25...	67	1.3	800	8.8	12.5	9	13	8.0	--	.01	3

09306237 DRY FORK NEAR RANGELY, COLO.

OCATION.--Lat 39°55'20', long 108°31'55", in SE¼NE¼ sec.32, T.1 S., R.99 W., Rio Blanco County, at gaging station, on left bank 1.7 mi (2.7 km) upstream from mouth and 18 mi (29 km) southeast of Rangely.

DRAINAGE AREA.--2.74 mi² (7.10 km²).

ERIOD OF RECORD.--Chemical analyses: April 1974 to current year.
Sediment records: October 1974 to September 1975.

REMARKS.--Flow occurred only on days shown.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)
MAR			
14...	.01	120	.03
15...	.02	120	.03
16...	.02	130	.03
19...	.02	100	.04
20...	.02	90	.01

09306240 BOX ELDER GULCH NEAR RANGELY, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAY											
14...	8	100	100	0	20	3	2	20	.0	3	0
28...	5	0	110	0	0	6	3	10	.0	5	10
JUNE											
16...	5	67	60	0	<4	2	<4	10	.0	4	0
25...	3	0	70	0	0	1	1	20	.0	5	0

DATE	FECAL COLI-FORM (COL. PER 100 ML)	TOTAL ORGANIC CARBON (C) (MG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR-DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL HEPTA-CHLOR (UG/L)	TOTAL HEPTA-CHLOR EPOXIDE (UG/L)
JUNE												
16...	84	11	.00	.0	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL LINDANE (UG/L)	TOTAL MALA-THION (UG/L)	TOTAL METHYL PARA-THION (UG/L)	TOTAL PARA-THION (UG/L)	TOTAL PCB (UG/L)	TOTAL TOX-APHENE (UG/L)	TOTAL SILVEX (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED BERYL-LIUM (BE) (UG/L)	DIS-SOLVED BISMUTH (BI) (UG/L)
JUNE												
16...	.00	.00	.00	.00	.0	0	.00	.00	.00	30	<2	<4

DATE	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED GALLIUM (GA) (UG/L)	DIS-SOLVED GER-MANIUM (GE) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED TIN (SN) (UG/L)	DIS-SOLVED TI-TANIUM (TI) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	DIS-SOLVED ZIR-CONIUM (ZR) (UG/L)
JUNE											
16...	<4	<2	<5	35	<4	0	700	<4	<2	6.0	<5

DATE	TIME	WATER TEM-PERA-TURE (°C)	DISCHARGE (CFS)	CONCEN-TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00
MAR., 1975																
03...	1400	----	0.01	16	0						73					
MAY																
14...	1645	----	.60	108	.17						95					
21...	1515	12.0	2.6	2800	20						52					
22...	1625	13.5	2.3	2880	18						40					
25...	1540	----	1.9	1020	5.2						57					
JUNE																
09...	1300	14.0	2.5	405	2.7						75					
12...	1435	22.5	2.1	203	1.2						76					
25...	1100	12.5	.49	53	.07						100					
JULY																
03...	0145	----	.25	2460	1.7						77					

09306240 BOX ELDER GULCH NEAR RANGELY, COLO.--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1							0	---	---
2							0	---	---
3							.10	14	0
4							.10	10	0
5							0	---	---
6							0	---	---
7							0	---	---
8							0	---	---
9							0	---	---
10							0	---	---
11							0	---	---
12							0	---	---
13							0	---	---
14							0	---	---
15							0	---	---
16							0	---	---
17							0	---	---
18							0	---	---
19							0	---	---
20							0	---	---
21							0	---	---
22							0	---	---
23							0	---	---
24							0	---	---
25							0	---	---
26							0	---	---
27							0	---	---
28							0	---	---
29							0	---	---
30							0	---	---
31							0	---	---

	APRIL			MAY			JUNE		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	0	---		.01	5	0	2.5	1010	6.9
2	0	---		.02	15	0	2.8	1100	8.3
3	0	---		.05	30	0	2.9	2100	16
4	0	---		.22	100	.06	2.8	1790	14
5	0	---		.38	100	.10	2.8	1820	14
6	0	---		.31	100	.08	2.8	1330	10
7	0	---		.42	125	.14	2.8	1520	11
8	0	---		.30	125	.10	2.7	462	3.4
9	0	---		.28	125	.09	2.7	528	3.9
10	0	---		.40	150	.16	2.5	380	2.6
11	0	---		.53	150	.21	2.3	280	1.7
12	0	---		.66	150	.27	2.3	317	2.0
13	0	---		.69	150	.28	2.3	226	1.4
14	0	---		.76	180	.37	2.2	169	1.0
15	0	---		.72	190	.37	1.9	105	.54
16	0	---		.86	250	.58	1.7	145	.67
17	0	---		.94	275	.70	1.7	153	.70
18	0	---		1.2	350	1.1	1.6	137	.59
19	0	---		1.6	700	3.0	1.3	125	.45
20	0	---		2.2	2100	12	1.3	140	.49
21	0	---		2.6	2720	19	1.1	150	.45
22	0	---		2.7	2940	21	.90	93	.22
23	0	---		2.6	[illegible]	16	.79	60	.07
24	0	---		2.3	2570	16	[illegible]	59	.08
25	0	---		2.1	1980	11	.50	58	.07
26	0	---		2.3	[illegible]	10	[illegible]	40	.05
27	0	---		[illegible]	1580	[illegible]	[illegible]	40	.05
28	0	---		[illegible]	1300	[illegible]	.43	41	.04
29	0	---		[illegible]	[illegible]	[illegible]	[illegible]	40	.03
30	0	---		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
31	---	---		[illegible]	[illegible]	[illegible]	[illegible]	---	---

09306240 BOX ELDER GULCH NEAR RANGELY, COLO.--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	JULY			AUGUST			SEPTEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.19	40	.02	0	---	0			
2	.13	30	.01	0	---	0			
3	.12	30	.01	0	---	0			
4	.05	20	0	0	---	0			
5	0	---	0	0	---	0			
6	0	---	0	0	---	0			
7	0	---	0	0	---	0			
8	0	---	0	0	---	0			
9	.70	200	.38	0	---	0			
10	.10	70	.02	.31	200	.17			
11	.11	30	.01	0	---	0			
12	.06	20	0	0	---	0			
13	0	---	0	0	---	0			
14	0	---	0	0	---	0			
15	0	---	0	0	---	0			
16	0	---	0	0	---	0			
17	0	---	0	0	---	0			
18	0	---	0	0	---	0			
19	0	---	0	0	---	0			
20	0	---	0	0	---	0			
21	0	---	0	0	---	0			
22	0	---	0	0	---	0			
23	0	---	0	0	---	0			
24	0	---	0	0	---	0			
25	0	---	0	0	---	0			
26	0	---	0	0	---	0			
27	0	---	0	0	---	0			
28	0	---	0	0	---	0			
29	0	---	0	0	---	0			
30	0	---	0	0	---	0			
31	0	---	0	0	---	0			

09306241 BOX ELDER GULCH TRIBUTARY NEAR RANGELY, COLO.

LOCATION.--Lat 39°54'50", long 108°29'06", in SE¼SE¼ sec.34, T.1 S., R.99 W., Rio Blanco County, at gaging station, on right bank 880 ft (270 m) above mouth, 3.5 mi (5.6 km) west of 84 Ranch, and 20.5 mi (33.0 km) southeast of Rangely.

DRAINAGE AREA.--3.5 mi² (9.0 km²), approximately.

PERIOD OF RECORD.--Chemical analyses: April 1974 to current year.
Sediment records: October 1974 to September 1975.

REMARKS.--Flow occurred only on days shown.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)
FEB			
28...	.02	500	.03
MAR			
01...	.10	600	.16
02...	.15	600	.24
03...	.02	200	.01

09306212 CORRAL GULCH NEAR RANGELY, COLO.

LOCATION.--Lat 39°55'13", long 108°28'20", in SE¼NW¼ sec.25, T.1 S., R.99 W., Rio Blanco County, at gaging station, on left bank 5 ft (2 m) downstream from Box Elder Creek, 3.5 mi (5.6 km) upstream from confluence with Stake Springs Draw, and 21 mi (34 km) southeast of Rangely.

DRAINAGE AREA.--31.6 mi^2 (81.8 km^2).

PERIOD OF RECORD.--Chemical analyses: March 1974 to current year.
Specific conductance: April to September 1975.
Water temperatures: January to September 1975.
Sediment records: October 1974 to September 1975.

EXTREMES, 1975.--Water temperatures: Maximum, 25.0°C May 14; minimum, freezing point Mar. 19.
Sediment concentrations: Maximum daily, 11,600 mg/L Sept. 14; minimum, 8 mg/L Sept. 13, 25.
Sediment loads: Maximum daily, 94 tons (85 t) Sept. 14; minimum daily, 0.01 tons (0.01 t) on several days during March and September.

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)
OCT.												
03...	1430	--	23	140	20	90	66	120	2.3	511	0	419
09...	1345	--	21	110	50	89	65	110	.8	493	0	404
16...	1300	--	14	40	50	87	64	120	1.0	427	0	350
24...	1415	--	22	20	10	87	53	110	1.9	462	0	379
NOV.												
01...	1045	.45	22	30	10	86	56	110	1.9	438	0	359
13...	1445	.32	22	20	30	86	62	110	1.0	494	0	405
DEC.												
11...	1300	.40	21	25	47	92	64	120	1.5	515	0	422
23...	1400	.36	21	30	30	89	63	110	1.6	509	0	417
JAN.												
21...	1445	.53	21	10	20	84	64	110	1.6	510	0	418
FEB.												
12...	1430	--	20	30	40	86	71	120	2.1	506	0	415
27...	1400	.60	20	10	20	88	70	110	2.1	506	0	415
MAR.												
02...	1600	--	--	--	--	--	--	--	--	--	--	--
03...	1230	--	--	--	--	--	--	--	--	--	--	--
12...	1100	.34	13	120	43	90	70	110	1.4	508	0	417
19...	1635	--	--	--	--	--	--	--	--	--	--	--
26...	1415	.58	20	10	30	92	70	110	1.3	508	0	417
APR.												
09...	1100	1.2	19	30	0	60	52	300	2.3	901	0	739
23...	1100	1.3	19	10	70	55	59	240	2.0	735	0	603
MAY												
14...	1245	.46	21	30	20	88	63	120	1.8	513	0	421
21...	1830	--	--	--	--	--	--	--	--	--	--	--
28...	1430	3.1	20	30	20	68	53	250	2.2	815	0	669
JUNE												
11...	1430	--	23	70	0	76	56	94	1.4	461	0	378
24...	1330	1.5	21	0	5	74	54	110	1.4	489	0	401
JULY												
15...	1215	1.1	21	20	0	80	55	110	1.4	474	0	389
30...	1230	1.0	22	10	0	77	64	110	1.6	464	0	381
AUG.												
12...	1500	.62	22	20	10	79	57	120	1.4	426	0	349
27...	1130	.66	21	10	10	84	67	120	1.7	503	0	413
SEP.												
08...	1430	.57	21	50	10	81	65	120	1.5	495	0	406
24...	1225	.34	21	10	20	89	66	120	1.3	512	0	420

09306242 CORRAL GULCH NEAR RANGELY, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	DIS-SOL-VED SUL-FIDE (S) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED NITRITE (N) (MG/L)	DIS-SOLVED AMMONIA NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL ORTHO PHOS-PHORUS (P) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)
OCT.												
03...	--	320	9.8	.4	--	--	--	--	--	--	.06	885
09...	--	300	9.1	.3	--	--	--	--	--	--	.03	840
16...	--	270	9.1	.3	--	--	--	--	--	--	.01	776
24...	--	300	8.6	.4	--	--	--	--	--	--	.01	813
NOV.												
01...	--	300	8.1	.3	--	--	--	--	--	--	.02	802
13...	--	290	8.4	.3	--	--	--	--	--	--	.02	825
DEC.												
11...	.2	300	11	.4	.28	.00	.04	.45	.05	.02	.01	867
23...	.8	300	8.8	.4	.38	.00	.01	.40	.05	.01	.03	848
JAN.												
21...	.0	300	8.6	.4	.31	.00	.01	.31	.04	.03	.02	843
FEB.												
12...	.1	320	10	.3	.28	.00	.02	.25	.06	.03	.03	881
27...	.1	300	11	.5	.25	.00	.05	.22	.04	.03	.04	853
MAR.												
02...	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--	--
12...	.0	290	8.9	.4	.26	.02	.22	.67	.11	.37	.09	838
19...	--	--	--	--	--	--	--	--	--	--	--	--
26...	.1	310	9.0	.5	.26	.00	.01	.24	.02	.02	.02	865
APR.												
09...	.3	240	11	6.9	.28	.00	.27	2.4	.58	.60	.02	1140
23...	.0	280	16	4.3	.33	.03	.12	1.1	.05	.58	.04	1040
MAY												
14...	.2	290	11	.4	.32	.00	.02	.14	.06	.05	.05	850
21...	--	--	--	--	--	--	--	--	--	--	--	--
28...	.2	200	15	2.8	.67	.01	.17	2.2	.03	.41	.04	1020
JUNE												
11...	.2	200	8.8	.5	.68	.01	.00	.67	.04	.54	.00	691
24...	.0	210	9.7	.5	.56	.01	.00	.30	.03	.07	.02	724
JULY												
15...	.0	260	11	.5	.36	.01	.03	.52	.01	.04	.05	775
30...	.0	260	10	.6	.33	.01	.00	.30	.04	.04	.01	776
AUG.												
12...	.2	290	11	.4	.29	.01	.00	.19	.04	.04	.02	793
27...	.0	280	9.7	.5	.28	.01	.00	.30	.02	.00	.02	834
SEP.												
08...	.2	290	11	.5	.26	.01	.00	.25	.04	.04	.02	837
24...	.0	290	10	.5	.28	.01	.03	.48	.03	.07	.03	852

09306242 CORRAL GULCH NEAR RANGELY, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	SODIUM AD-SORP-TION RATIO	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	DIS-SOLVED OXYGEN (MG/L)	CYANIDE (CN) (MG/L)	OIL AND GREASE (MG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)
OCT.												
03...	500	81	2.3	1340	8.0	10.0	--	--	9.0	--	--	5
09...	490	86	2.2	1240	7.9	14.5	--	--	10.3	--	--	7
16...	480	130	2.4	1180	7.8	12.0	--	--	13.0	--	--	6
24...	440	61	2.3	1230	7.6	10.0	--	--	9.7	--	--	3
NOV.												
01...	450	91	2.3	1220	8.1	8.0	--	--	8.6	--	--	5
13...	470	65	2.2	1220	7.7	9.0	--	--	9.5	--	--	7
DEC.												
11...	500	73	2.4	1180	8.0	8.0	3	4	11.0	.00	1	6
23...	480	64	2.2	1300	7.8	7.0	10	2	9.8	.00	3	4
JAN.												
21...	470	55	2.2	1290	7.9	6.0	0	5	10.6	.00	6	4
FEB.												
12...	510	92	2.3	1300	8.2	8.0	3	2	10.6	.00	9	1
27...	510	93	2.1	1220	7.6	9.0	5	3	7.6	.00	10	2
MAR.												
02...	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--	--
12...	520	98	2.1	1200	7.8	8.0	8	1000	9.0	.00	4	6
19...	--	--	--	--	--	--	--	--	--	--	--	--
26...	520	100	2.1	1180	7.9	7.0	3	5	--	.00	2	2
APR.												
09...	360	0	6.8	1720	8.3	7.0	5	740	5.4	.00	2	7
23...	380	0	5.4	1550	8.2	13.0	0	50	7.3	.01	3	2
MAY												
14...	480	58	2.4	1300	7.1	14.0	5	1	8.0	.01	0	5
21...	--	--	--	--	--	--	--	--	--	--	--	--
28...	390	0	5.5	1550	8.0	11.0	6	120	8.1	.02	2	9
JUNE												
11...	420	42	2.0	1100	8.0	19.0	17	150	5.0	.02	2	4
24...	410	6	2.4	1200	8.2	15.0	10	50	4.8	.01	3	3
JULY												
15...	430	37	2.3	1000	8.2	15.0	6	13	6.7	.00	2	5
30...	460	75	2.2	1150	8.9	17.0	6	4	7.6	.00	1	6
AUG.												
12...	430	83	2.5	1200	8.2	13.0	10	2	--	.00	1	6
27...	490	73	2.4	1100	7.7	15.5	7	2	--	.00	1	4
SEP.												
08...	470	65	2.4	1200	7.8	11.0	4	0	9.0	.00	1	7
24...	490	74	2.4	1300	7.6	12.0	4	2	10.3	.00	2	6

09306242 CORRAL GULCH NEAR RANGELY, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	DISSOLVED BARIUM (BA) (UG/L)	DISSOLVED BORON (B) (UG/L)	DISSOLVED CADMIUM (CD) (UG/L)	DISSOLVED CHROMIUM (CR) (UG/L)	DISSOLVED COPPER (CU) (UG/L)	DISSOLVED LEAD (PB) (UG/L)	DISSOLVED MERCURY (HG) (UG/L)	DISSOLVED LITHIUM (LI) (UG/L)	DISSOLVED SELENIUM (SE) (UG/L)	DISSOLVED ZINC (ZN) (UG/L)	SUSPENDED SEDIMENT (MG/L)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT.												
03...	0	60	1	--	10	2	.0	0	4	10	--	--
09...	0	120	<1	--	1	6	.5	0	3	80	--	--
16...	0	120	<1	--	0	3	.0	0	3	100	--	--
24...	0	150	0	--	0	3	.0	0	5	10	--	--
NOV.												
01...	<100	80	0	--	0	1	.0	0	3	30	--	--
13...	0	120	0	--	0	1	.0	0	3	20	--	--
DEC.												
11...	53	90	<20	<6	1	<6	<.1	10	2	<20	--	--
23...	<100	110	0	0	4	1	.1	20	3	40	--	--
JAN.												
21...	0	120	1	10	2	4	.0	20	2	20	--	--
FEB.												
12...	100	110	1	0	13	5	.0	30	2	20	--	--
27...	<100	130	0	0	4	5	.1	20	2	7	22	89
MAR.												
02...	--	--	--	--	--	--	--	--	--	--	320	98
03...	--	--	--	--	--	--	--	--	--	--	595	99
12...	50	100	<60	<5	2	<6	.0	14	2	0	11	92
19...	--	--	--	--	--	--	--	--	--	--	437	97
26...	<100	100	0	0	0	0	.0	20	2	0	83	68
APR.												
09...	<100	320	0	0	3	2	.3	30	2	40	1570	100
23...	0	550	1	0	6	8	.0	20	1	10	--	--
MAY												
14...	0	160	1	0	1	1	.0	10	2	6	313	69
21...	--	--	--	--	--	--	--	--	--	--	4870	75
28...	100	670	0	0	1	1	.0	20	2	10	3130	75
JUNE												
11...	100	150	0	0	0	0	.0	10	3	10	1320	66
24...	0	160	0	0	1	1	.0	10	4	4	713	72
JULY												
15...	100	140	0	0	0	0	.0	0	3	0	--	--
30...	0	120	3	0	4	3	.0	10	3	20	--	--
AUG.												
12...	100	140	0	10	3	0	.0	10	4	0	--	--
27...	<200	150	0	50	1	0	.0	10	1	0	--	--
SEP.												
08...	56	110	1	<6	10	<6	.0	10	2	10	--	--
24...	<200	160	0	10	1	3	.0	10	3	10	--	--

09306242 CORRAL GULCH NEAR RANGELY, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TOTAL ALUMINUM (AL) (UG/L)	DISSOLVED ALUMINUM (AL) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL FILTRABLE RESIDUE (MG/L)	TOTAL NONFILTRABLE RESIDUE (MG/L)	CHEMICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	DISSOLVED ORGANIC CARBON (C) (MG/L)	SUSPENDED ORGANIC CARBON (C) (MG/L)	TOTAL BARIUM (BA) (UG/L)	TOTAL BERYLLIUM (BE) (UG/L)
DEC. 11...	--	40	--	--	930	1	11	15	--	--	--	--
MAR. 12...	--	20	--	--	880	2	94	9.8	--	--	--	--
JUNE 11...	37000	--	18000	480	--	--	32	10	9.7	8.7	550	<4
SEP. 08...	--	30	--	--	840	<1	9	--	--	--	--	--

DATE	DISSOLVED BERYLLIUM (BE) (UG/L)	TOTAL BISMUTH (BI) (UG/L)	DISSOLVED BISMUTH (BI) (UG/L)	TOTAL BORON (B) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DISSOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL GALLIUM (GA) (UG/L)	DISSOLVED GALLIUM (GA) (UG/L)	TOTAL GERMANIUM (GE) (UG/L)
DEC. 11...	<2	--	<6	--	--	--	--	<6	--	--	<3	--
MAR. 12...	<2	--	<5	--	--	--	--	<5	--	--	<2	--
JUNE 11...	--	<9	--	180	0	40	12	--	13	<4	--	<13
SEP. 08...	<2	--	<6	--	--	--	--	<3	--	--	<3	--

DATE	DISSOLVED GERMANIUM (GE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL LITHIUM (LI) (UG/L)	TOTAL MOLYBDENUM (MO) (UG/L)	DISSOLVED MOLYBDENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)	DISSOLVED NICKEL (NI) (UG/L)	TOTAL SILVER (AG) (UG/L)	DISSOLVED SILVER (AG) (UG/L)	TOTAL STRONTIUM (SR) (UG/L)	DISSOLVED STRONTIUM (SR) (UG/L)	TOTAL TIN (SN) (UG/L)
DEC. 11...	<6	--	--	--	26	--	<5	--	0	--	2000	--
MAR. 12...	<6	--	--	--	30	--	<4	--	0	--	1600	--
JUNE 11...	--	18	50	43	--	34	--	<1	--	1500	--	<9
SEP. 08...	<6	--	--	--	56	--	<6	--	0	--	1400	--

DATE	DISSOLVED TIN (SN) (UG/L)	TOTAL TITANIUM (TI) (UG/L)	DISSOLVED TITANIUM (TI) (UG/L)	TOTAL VANADIUM (V) (UG/L)	DISSOLVED VANADIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ZIRCONIUM (ZR) (UG/L)	DISSOLVED ZIRCONIUM (ZR) (UG/L)	DISSOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUSPENDED GROSS ALPHA AS U-NAT. (UG/L)	DISSOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUSPENDED GROSS BETA AS SR90 /Y90 (PC/L)
DEC. 11...	<6	--	<4	--	4.0	--	--	<9	<12	<.4	<2.5	<.4
MAR. 12...	<5	--	<4	--	3.0	--	--	<9	<10	<.4	<2.4	<.4
JUNE 11...	--	2000	--	50	--	50	85	--	--	--	--	--
SEP. 08...	<6	--	<3	--	4.0	--	--	<12	<6.7	.5	7.5	1.2

DATE	TOTAL ALDRIN (UG/L)	TOTAL CHLOR-DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL HEPTA-CHLOR (UG/L)	TOTAL HEPTA-CHLOR EPOXIDE (UG/L)
DEC. 11...	.00	.0	.00	.00	.00	.00	.00	.00	.00	.00
MAR. 12...	.00	.0	.00	.00	.00	.00	.00	.00	.00	.00
JUNE 11...	.00	.0	.00	.00	.00	.00	.00	.00	.00	.00
SEP. 08...	.00	.0	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL LINDANE (UG/L)	TOTAL MALA-THION (UG/L)	TOTAL METHYL PARA-THION (UG/L)	TOTAL PARA-THION (UG/L)	TOTAL PCB (UG/L)	TOTAL SILVEX (UG/L)	TOTAL TOX-APHENE (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)
DEC. 11...	.00	.00	.00	.00	.0	.00	0	.00	.00
MAR. 12...	.00	.00	.00	.00	.0	.00	0	.00	.00
JUNE 11...	.00	.00	.00	.00	.0	.00	0	.00	.00
SEP. 08...	.00	.00	.00	.00	.0	.00	0	.00	.00

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	1250	---	---	---	---	1450	1560	1640	1150	1160	1240
2	---	---	---	---	---	---	1510	1550	1580	1260	1130	1240
3	1200	---	---	---	---	---	1580	1570	1510	1300	1120	1220
4	---	---	---	---	---	---	1610	1570	1540	1340	1120	1210
5	---	---	---	---	---	1210	1510	1310	1310	1360	1120	1220
6	---	---	---	---	---	---	1600	1300	1150	1370	1130	1210
7	---	---	---	---	---	---	1610	1340	1110	---	1150	1220
8	---	---	---	1150	---	---	1790	1360	1120	---	1160	1250
9	1300	---	---	---	---	---	1700	1360	1110	---	1160	1260
10	---	---	---	---	---	---	1550	1390	1130	---	1160	1260
11	---	---	1180	---	---	---	1500	1410	1160	---	1160	1270
12	---	---	---	---	1300	1200	1470	1430	1140	---	1160	1250
13	---	1220	---	---	---	---	1420	1420	1170	---	1150	1250
14	1400	---	---	---	---	---	1400	1430	1230	---	1150	1090
15	---	---	---	---	---	---	1500	1430	1230	1000	---	1030
16	---	---	---	---	---	---	1600	1230	1210	---	---	1090
17	---	---	---	---	---	---	1490	1020	1200	---	---	1170
18	---	---	---	---	---	---	1650	938	1180	---	---	1190
19	---	---	---	---	---	---	1650	890	1190	---	---	1180
20	---	---	---	---	---	---	1630	1000	1200	---	---	1170
21	---	---	---	1290	---	---	1580	1550	1240	---	---	1150
22	---	---	---	---	---	---	1600	2050	1220	---	---	1150
23	1100	---	1300	---	---	---	1590	1840	1290	---	---	1170
24	---	---	---	---	---	---	1550	1930	1230	---	---	1160
25	---	---	---	---	---	---	1590	1860	1170	---	---	1250
26	---	---	---	---	---	1180	1540	1950	1100	---	---	1250
27	---	---	---	---	1220	---	1540	1840	1090	---	---	1250
28	---	---	---	---	---	---	1520	1690	1080	---	1260	1240
29	---	---	---	---	---	---	1550	1700	1070	---	1250	1220
30	---	---	---	---	---	---	1550	1720	1060	1170	1240	1220
31	---	---	---	---	---	---	---	1690	---	1160	1240	---
MONTH	---	---	---	---	---	---	1560	1490	1220	---	---	1200

09306242 CORRAL GULCH NEAR RANGELY, COLO.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1							---	---	9.0	5.0	11.5	1.5
2							---	---	9.0	5.0	12.5	2.0
3							---	---	9.5	6.0	11.5	5.5
4							---	---	9.5	6.5	10.5	4.5
5							---	---	10.0	6.0	10.0	3.5
6							---	---	10.0	6.5	9.5	4.5
7							---	---	9.5	5.5	9.5	2.5
8							---	---	9.0	5.5	9.0	2.0
9							---	---	9.0	5.5	9.5	2.0
10							---	---	9.5	7.0	10.0	3.5
11							---	---	9.5	5.5	10.5	4.0
12							---	---	9.5	5.0	11.0	2.5
13							---	---	9.5	5.0	9.0	4.5
14							---	---	8.5	6.5	10.5	5.0
15							---	---	8.0	6.0	10.5	1.5
16							---	---	9.0	5.0	10.0	3.0
17							---	---	10.0	4.5	9.5	2.5
18							---	---	10.0	5.5	9.5	2.0
19							---	---	10.0	5.5	10.0	0.0
20							---	---	10.0	5.5	9.0	1.0
21							---	---	10.0	7.0	8.0	0.5
22							9.0	5.5	10.0	6.5	9.5	4.0
23							8.0	4.5	10.0	5.0	9.0	5.0
24							8.5	5.0	10.5	3.5	9.0	4.5
25							8.5	5.0	10.5	3.0	8.0	5.0
26							8.5	4.5	10.5	3.0	9.0	4.0
27							9.0	6.0	8.5	3.5	9.0	6.0
28							9.5	7.5	10.0	1.5	9.0	5.5
29							9.5	7.0	---	---	9.0	5.0
30							9.5	6.0	---	---	8.5	2.0
31							9.0	5.5	---	---	8.5	6.0
MONTH							---	---	10.5	1.5	12.5	0.0

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	6.5	4.0	15.0	3.5	20.0	7.0	18.5	9.0	18.0	8.5	14.0	10.0
2	9.5	4.0	15.0	6.0	20.0	7.0	16.0	8.0	17.5	7.0	14.5	10.5
3	11.0	3.5	16.5	6.5	19.5	7.5	14.5	8.5	17.5	7.0	14.5	10.5
4	13.0	4.0	13.5	7.0	19.5	8.0	15.0	9.0	17.0	7.0	15.0	10.5
5	13.5	4.5	14.0	4.5	21.5	6.5	16.0	8.5	16.0	7.5	15.0	10.5
6	13.5	4.0	14.0	4.5	21.0	5.5	16.0	9.0	16.0	8.0	15.0	10.5
7	11.0	4.0	10.5	5.0	16.5	7.0	17.5	9.0	16.0	8.5	15.5	11.0
8	11.0	4.0	16.5	5.0	13.0	6.5	---	---	16.0	8.0	14.0	11.5
9	11.5	3.5	19.0	3.5	16.5	3.5	---	---	15.5	8.0	15.0	11.5
10	15.0	3.5	21.5	3.5	10.5	4.0	---	---	16.0	8.5	15.5	11.5
11	13.0	5.5	23.0	4.5	19.0	2.0	---	---	14.5	9.5	13.5	11.5
12	14.5	5.5	16.5	4.0	17.5	3.0	---	---	16.0	8.5	15.5	11.5
13	16.0	3.5	26.0	6.0	18.0	5.0	---	---	14.0	9.0	14.5	11.5
14	13.5	4.0	25.0	5.0	17.5	7.0	---	---	15.0	8.5	14.5	11.0
15	12.0	5.0	24.5	5.5	17.5	5.5	---	---	---	---	16.5	10.5
16	14.5	5.0	18.0	7.0	16.5	7.5	18.0	8.0	---	---	15.0	11.0
17	11.5	4.0	20.0	7.5	13.5	7.0	18.5	8.0	---	---	16.0	11.0
18	13.5	3.5	16.5	8.0	10.5	6.0	18.0	9.0	---	---	15.5	10.5
19	13.0	4.0	18.0	6.5	15.5	4.5	15.0	9.0	---	---	15.0	9.5
20	13.0	5.5	17.5	8.0	15.0	5.5	17.0	9.5	---	---	14.5	9.5
21	16.5	5.0	17.5	6.0	16.0	5.0	15.5	9.0	---	---	14.5	9.5
22	16.0	5.5	18.5	9.5	17.0	6.0	---	---	---	---	15.0	9.5
23	15.5	5.5	20.5	9.0	17.0	6.5	---	---	---	---	15.0	9.5
24	17.0	5.5	22.0	10.0	17.5	7.0	---	---	---	---	15.0	9.5
25	15.0	6.0	21.5	10.5	16.0	8.5	---	---	---	---	15.0	9.5
26	14.0	6.5	22.0	7.5	20.0	7.0	---	---	---	---	15.0	10.0
27	13.5	6.0	18.0	9.0	19.0	8.0	---	---	---	---	15.0	9.5
28	17.0	5.0	17.0	9.0	20.0	8.5	---	---	13.5	10.0	15.0	9.5
29	12.0	6.5	15.0	7.0	19.0	[illegible]	---	---	14.0	9.5	15.0	[illegible]
30	13.5	4.0	20.0	5.5	19.0	8.5	18.0	9.5	14.5	9.5	14.5	[illegible]
31	---	---	19.0	7.5	---	---	17.5	9.0	14.5	9.5	---	---
MONTH	17.0	3.5	25.0	3.5	21.5	2.0	---	---	---	---	16.5	9.5

09306242 CORRAL GULCH NEAR RANGELY, COLO.--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	OCTOBER			NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.40	40	.04	.44	322	.38	.44	343	.41
2	.40	40	.04	.44	177	.21	.44	246	.29
3	.45	40	.05	.41	176	.19	.44	241	.29
4	.46	50	.06	.41	155	.17	.44	190	.23
5	.47	72	.09	.41	70	.08	.44	168	.20
6	.50	104	.14	.41	178	.20	.41	148	.16
7	.52	148	.21	.37	85	.09	.41	100	.11
8	.52	160	.22	.37	234	.23	.41	68	.08
9	.57	111	.17	.37	198	.20	.41	54	.06
10	.58	33	.05	.36	180	.18	.41	35	.04
11	.58	37	.06	.36	162	.16	.41	16	.02
12	.58	42	.07	.35	152	.14	.41	57	.06
13	.52	77	.11	.39	256	.27	.41	93	.10
14	.52	264	.37	.63	900	1.5	.41	108	.12
15	.52	64	.09	.48	270	.35	.41	158	.18
16	.55	62	.09	.36	270	.26	.41	167	.18
17	.47	60	.10	.35	270	.26	.41	194	.21
18	.47	38	.05	.34	252	.23	.64	240	.41
19	.52	21	.03	.36	252	.25	.52	289	.41
20	.52	98	.14	.38	247	.25	.47	284	.36
21	.52	204	.29	.34	238	.22	.47	279	.35
22	.52	146	.21	.34	228	.21	.44	240	.29
23	.55	205	.30	.34	207	.19	.40	240	.26
24	.55	101	.15	.34	198	.18	.34	209	.19
25	.54	58	.08	.34	189	.17	.34	178	.16
26	.48	224	.29	1.0	219	.59	.38	200	.21
27	.47	187	.24	1.0	634	1.7	.39	197	.20
28	.47	270	.34	.58	986	1.5	.38	180	.18
29	.47	87	.11	.44	542	.64	.38	171	.18
30	.44	244	.29	.44	354	.42	.38	171	.18
31	.44	176	.21	---	---	---	.38	162	.17

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.40	162	.16	.52	39	.05	.74	5500	11
2	.40	152	.16	.52	45	.06	.84	2700	6.1
3	.40	152	.16	.52	103	.14	.64	548	.95
4	.40	142	.15	.52	132	.19	.58	564	.88
5	.40	142	.15	.52	128	.18	.61	168	.28
6	.40	133	.14	.52	133	.19	.52	284	.40
7	.40	133	.14	.52	145	.20	.49	269	.36
8	.40	122	.13	.47	112	.14	.42	89	.10
9	.40	117	.13	.52	82	.12	.40	91	.10
10	.40	108	.12	.52	62	.09	.41	85	.09
11	.40	108	.12	.52	50	.07	.38	58	.06
12	.40	94	.10	.52	36	.05	.34	16	.01
13	.44	94	.11	.52	23	.03	.34	21	.02
14	.47	80	.10	.52	23	.03	.34	21	.02
15	.47	85	.10	.52	21	.03	.34	21	.02
16	.47	64	.08	.52	19	.03	.38	28	.03
17	.47	64	.08	.52	24	.03	.38	22	.02
18	.47	45	.06	.52	22	.03	.38	30	.03
19	.47	45	.06	.47	28	.04	.44	71	.08
20	.50	30	.04	.47	30	.04	.58	82	.13
21	.50	14	.02	.47	43	.05	.52	45	.06
22	.52	15	.02	.52	32	.05	.52	60	.08
23	.52	15	.02	.52	24	.03	.44	32	.04
24	.52	24	.03	.52	18	.03	.47	31	.04
25	.52	30	.04	.52	28	.04	.47	26	.03
26	.52	90	.13	.52	20	.03	.47	40	.05
27	.52	[illegible]	[illegible]	.54	25	[illegible]	.52	92	.13
28	[illegible]	85	.11	.54	175	[illegible]	[illegible]	93	.14
29	.47	61	[illegible]	---	---	---	[illegible]	118	[illegible]
30	.47	41	[illegible]	---	---	---	[illegible]	102	[illegible]
31	[illegible]	45	.05	---	---	---	.52	[illegible]	[illegible]

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	APRIL			MAY			JUNE		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.52	80	.11	1.4	486	1.8	3.7	2800	28
2	.52	94	.13	1.3	385	1.4	3.5	2300	22
3	.52	84	.12	1.4	190	.72	4.0	2640	29
4	.52	122	.17	1.4	218	.82	4.0	2720	29
5	.58	144	.23	.95	200	.51	2.9	2640	21
6	.58	162	.25	.79	200	.43	3.3	2800	25
7	.58	145	.23	.74	210	.42	3.7	2640	26
8	.80	1300	2.8	.58	210	.33	2.9	2300	18
9	1.1	2090	6.2	.58	210	.33	2.9	1870	15
10	1.1	1780	5.3	.58	231	.36	2.8	1580	12
11	1.1	1670	5.0	.47	220	.28	2.9	1390	11
12	1.1	1220	3.6	.47	220	.28	2.5	1540	10
13	1.0	1070	2.9	.47	230	.29	2.3	1420	8.8
14	1.4	1450	5.5	.44	126	.15	2.3	1150	7.1
15	1.3	1390	4.9	.47	186	.24	1.9	990	5.1
16	1.3	1180	4.1	.68	240	.44	2.1	1000	5.7
17	1.2	1190	3.9	.95	372	.95	1.9	800	4.1
18	1.3	1010	3.5	1.4	1140	4.3	1.8	946	4.6
19	1.4	907	3.4	1.4	1740	6.6	1.7	1700	7.8
20	1.4	662	2.5	1.7	2390	11	1.8	1970	9.6
21	1.4	569	2.2	2.3	4560	28	1.6	805	3.5
22	1.4	562	2.2	2.8	3850	29	1.6	506	2.2
23	1.4	725	2.7	4.2	5640	64	1.3	564	2.0
24	1.4	816	3.1	5.3	5060	72	1.4	600	2.3
25	1.3	658	2.3	5.6	3460	52	1.3	715	2.5
26	1.3	528	1.9	3.7	3200	32	1.3	260	.91
27	1.2	527	1.7	3.5	2940	28	1.4	416	1.6
28	1.3	493	1.7	3.7	2920	29	1.2	350	1.1
29	1.1	391	1.2	4.0	2610	28	1.1	275	.82
30	1.3	436	1.5	3.1	2200	18	1.1	240	.71
31	---	---	---	3.5	2460	23	---	---	---

	JULY			AUGUST			SEPTEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	1.0	62	.17	.95	20	.05	.58	42	.07
2	.89	40	.10	.89	42	.10	.58	37	.06
3	.84	40	.09	.84	272	.62	.58	41	.06
4	.84	42	.10	.79	70	.15	.52	29	.04
5	.89	30	.07	.74	66	.13	.52	51	.07
6	.89	30	.07	.74	84	.17	.52	80	.11
7	.95	20	.05	.68	800	1.5	.52	51	.07
8	.95	24	.06	.68	171	.31	.56	63	.10
9	1.6	138	.60	.63	86	.14	.52	25	.04
10	1.3	70	.25	.63	1200	2.0	.52	13	.02
11	1.3	84	.29	.63	94	.16	.47	13	.02
12	1.2	72	.23	.68	25	.05	.47	11	.01
13	1.1	82	.24	.68	38	.07	.52	8	.01
14	1.1	80	.24	.74	44	.09	1.1	11600	34
15	1.1	56	.17	.74	38	.08	.58	2200	3.4
16	1.3	56	.20	.66	88	.16	.58	24	.04
17	1.2	38	.12	.68	148	.27	.58	17	.03
18	1.1	67	.20	.68	189	.35	.58	19	.03
19	1.1	22	.07	.68	104	.19	.58	12	.02
20	1.0	33	.09	.63	87	.15	.54	9	.01
21	1.1	34	.10	.74	66	.13	.58	16	.03
22	1.0	34	.09	.74	56	.11	.58	12	.02
23	1.0	28	.08	.74	43	.09	.54	9	.01
24	1.0	30	.08	.74	38	.08	.58	11	.02
25	1.0	12	.03	.74	30	.06	.63	8	.01
26	.95	26	.07	.74	21	.04	.63	9	.02
27	.95	24	.06	.68	64	.12	.63	10	.02
28	1.0	26	.07	.68	47	.09	.63	9	.02
29	1.0	20	.05	.68	55	.10	.63	9	.02
30	1.1	11	.03	.63	55	.09	.63	10	.02
31	.95	11	.03	.63	38	.07	---	---	---

09306244 CORRAL GULCH AT 84 RANCH, NEAR RANGELY, COLO.

LOCATION.--Lat 39°56'04", long 108°25'38", in NE¼SE¼ sec.30, T.1 S., R.98 W., Rio Blanco County, at gaging station, 2.6 mi (4.18 km) downstream from Box Elder Creek, 0.5 mi (0.8 km) upstream from confluence with Stake Springs Draw, and 21 mi (33.8 km) southeast of Rangely.

DRAINAGE AREA.--37.8 mi^2 (100.5 km^2).

PERIOD OF RECORD.--Chemical analyses: June 1974 to September 1975.

WATER QUALITY RECORDS, OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)
JUNE												
12...	1300	--	19	80	110	120	110	190	1.9	649	0	532
25...	1300	.81	15	120	10	120	120	170	2.4	582	0	477
JULY												
15...	1330	.50	21	40	250	140	100	180	4.4	638	0	523
30...	1430	.72	17	60	190	120	120	190	4.1	640	0	525
AUG.												
27...	1300	.40	17	30	110	120	90	180	3.0	519	0	426
SEP.												
09...	0930	.27	20	90	90	120	120	180	2.8	658	0	540
24...	1345	.43	17	10	120	110	91	170	2.8	584	0	479

DATE	DISSOLVED SULFIDE (S) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED NITRATE (N) (MG/L)	DISSOLVED NITRITE (N) (MG/L)	DISSOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL ORTHO PHOSPHOPUS (P) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
JUNE												
12...	.0	590	19	.3	.05	.00	.01	.42	.01	.01	.01	1370
25...	.0	580	21	.3	1.3	.02	.00	.43	.00	.36	.00	1320
JULY												
15...	.1	600	23	.3	.50	.04	.00	.79	.01	.04	.02	1390
30...	.0	580	21	.4	.89	.05	.04	.86	.01	.02	.00	1370
AUG.												
27...	.0	560	20	.3	--	--	--	.57	.00	.00	--	1250
SEP.												
09...	.0	570	19	.3	.64	.04	.00	.41	.01	.02	.01	1360
24...	.0	510	19	.3	.72	.03	.05	1.6	.01	.00	.01	1210

09306244 CORRAL GULCH AT 84 RANCH, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	CYANIDE (CN) (MG/L)	OIL AND GREASE (MG/L)
JUNE											
12...	760	220	3.0	2000	7.5	10.0	17	2	4.4	.00	0
25...	790	320	2.6	1780	8.6	13.0	9	20	10.4	.01	2
JULY											
15...	760	240	2.8	2000	8.4	20.0	30	6	7.6	.00	4
30...	790	270	2.9	1900	8.5	23.0	20	5	13.8	.00	1
AUG.											
27...	670	240	3.0	1900	8.1	15.5	25	2	--	.00	1
SEP.											
09...	800	260	2.8	1800	8.1	12.0	7	0	10.2	.00	2
24...	650	170	2.9	--	8.1	20.5	6	1	7.9	.00	1

DATE	DISSOLVED ARSENIC (AS) (UG/L)	DISSOLVED BARIUM (BA) (UG/L)	DISSOLVED BORON (B) (UG/L)	DISSOLVED CADMIUM (CD) (UG/L)	DISSOLVED CHROMIUM (CR) (UG/L)	DISSOLVED COPPER (CU) (UG/L)	DISSOLVED LEAD (PB) (UG/L)	DISSOLVED MERCURY (HG) (UG/L)	DISSOLVED LITHIUM (LI) (UG/L)	DISSOLVED SELENIUM (SE) (UG/L)	DISSOLVED ZINC (ZN) (UG/L)
JUNE											
12...	3	54	140	0	<9	5	<9	.0	10	1	10
25...	3	0	160	0	0	1	1	.1	20	6	10
JULY											
15...	5	200	190	1	10	1	8	.0	0	3	10
30...	6	0	150	1	0	2	0	.0	0	3	20
AUG.											
27...	6	<200	200	0	0	0	0	.0	20	3	0
SEP.											
09...	7	110	130	0	<9	3	<9	.0	10	2	20
24...	4	100	190	1	10	2	3	.1	10	3	10

09306244 CORRAL GULCH AT 84 RANCH, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TOTAL ALUMINUM (AL) (UG/L)	DISSOLVED ALUMINUM (AL) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	CHEMICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	DISSOLVED ORGANIC CARBON (C) (MG/L)	SUSPENDED ORGANIC CARBON (C) (MG/L)	TOTAL BARIUM (BA) (UG/L)	TOTAL BERYLLIUM (BE) (UG/L)	DISSOLVED BERYLLIUM (BE) (UG/L)
JUNE 12...	60	50	140	100	25	11	9.4	.9	66	<4	<4
SEP. 09...	--	20	--	--	20	--	--	--	--	--	<2

DATE	TOTAL BISMUTH (BI) (UG/L)	DISSOLVED BISMUTH (BI) (UG/L)	TOTAL BORON (B) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DISSOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL GALLIUM (GA) (UG/L)	DISSOLVED GALLIUM (GA) (UG/L)	TOTAL GERMANIUM (GE) (UG/L)
JUNE 12...	<9	<9	130	0	<9	<9	<9	4	<4	<4	<13
SEP. 09...	--	<9	--	--	--	--	<4	--	--	<4	--

DATE	DISSOLVED GERMANIUM (GE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL LITHIUM (LI) (UG/L)	TOTAL MOLYBDENUM (MO) (UG/L)	DISSOLVED MOLYBDENUM (MO) (UG/L)	TOTAL NICKEL (NI) (UG/L)	DISSOLVED NICKEL (NI) (UG/L)	TOTAL SILVER (AG) (UG/L)	DISSOLVED SILVER (AG) (UG/L)	TOTAL STRONTIUM (SR) (UG/L)
JUNE 12...	<13	<9	10	75	60	<9	<9	<1	<1	2200
SEP. 09...	<9	--	--	--	55	--	<9	--	<1	--

DATE	DISSOLVED STRONTIUM (SR) (UG/L)	TOTAL TIN (SN) (UG/L)	DISSOLVED TIN (SN) (UG/L)	TOTAL TITANIUM (TI) (UG/L)	DISSOLVED TITANIUM (TI) (UG/L)	TOTAL VANADIUM (V) (UG/L)	DISSOLVED VANADIUM (V) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ZIRCONIUM (ZR) (UG/L)	DISSOLVED ZIRCONIUM (ZR) (UG/L)
JUNE 12...	2500	<9	<9	<5	<5	<9.0	<9.0	0	<13	<13
SEP. 09...	2300	--	<9	--	<4	--	<4.0	--	--	<20

DATE	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)
JUNE 12...	.00	.0	.00	.00	.00	.00	.00	.00	.00	.00
SEP. 09...	--	--	--	--	--	--	--	--	--	--

DATE	TOTAL LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL PCP (UG/L)	TOTAL SILVEX (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)
JUNE 12...	.00	.00	.00	.00	.0	.00	0	.00	.00
SEP. 09...	--	--	--	--	--	.00	--	.00	.00

09306255 YELLOW CREEK NEAR WHITE RIVER, COLO.

LOCATION.--Lat 40°10'07", long 108°24'02", in NE¼SW¼ sec.4, T.2 N., R.98 W., Rio Blanco County, at gaging station on left bank 160 ft (49 m) downstream from bridge on State Highway 64, 0.3 mi (0.5 km) upstream from mouth, and 10 mi (16 km) northwest of White River City.

DRAINAGE AREA.--262 mi² (679 km²).

PERIOD OF RECORD.--Chemical analyses: May 1974 to current year.
Specific conductance: April to September 1975.
Sediment records: April 1973 to current year.

EXTREMES, 1975.--Sediment concentrations: Maximum daily, 11,100 mg/L July 30; minimum, 27 mg/L June 12.
Sediment loads: Maximum daily, 56 tons (51 t) Mar. 2; minimum, 0.05 tons (0.05 t) Oct. 11.
Period of record.--Sediment concentrations: Maximum daily, 11,100 mg/L July 30, 1975; minimum, 6 mg/L June 4, 1974.
Sediment loads: Maximum daily, 56 tons (51 t) Mar. 2, 1975; minimum, 0.04 tons (0.04 t) June 4, 1974.

WATER QUALITY DATA. WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)
T.												
5...	1300	--	9.1	40	30	34	110	610	4.7	1210	106	1170
DEC.												
11...	1530	2.3	16	20	17	41	100	800	3.7	1760	46	1520
3...	1130	1.9	17	20	20	43	110	770	3.6	1760	0	1440
N.												
3...	1300	--	16	10	30	42	110	700	3.5	1530	0	1260
21...	1130	2.2	15	50	10	30	100	680	3.5	1350	105	1280
EB.												
12...	1030	2.0	15	170	40	45	120	730	4.3	1630	0	1340
7...	1100	2.3	15	10	50	40	130	710	4.2	1450	103	1360
R.												
2...	1400	2.4	20	65	14	37	110	710	4.6	1620	0	1330
26...	1030	2.2	14	20	20	45	130	700	3.5	1210	203	1330
PR.												
...	1200	3.4	14	10	10	37	98	680	3.8	1480	97	1380
..	1300	3.3	14	10	10	40	120	840	4.4	1930	0	1580
.	1000	1.9	11	30	30	7.0	130	710	7.4	1490	1	1220
15...	1100	1.7	7.1	40	10	31	120	740	3.9	1510	87	1380
...	1115	1.7	5.7	660	50	36	100	680	4.5	1150	194	1270
E												
...	1115	1.5	1.9	<8	<17	21	120	780	3.5	1490	140	1460
26...	1330	1.1	3.7	10	0	17	110	780	3.6	1550	139	1500
JULY												
...	1045	1.9	14	20	0	42	96	700	5.5	1340	107	1280
...	0920	1.1	.3	90	20	16	110	810	3.9	596	657	1580
.												
14...	0915	--	1.1	10	10	24	110	800	5.0	1220	308	1510
29...	1115	.76	3.7	30	0	18	97	840	4.8	1590	160	1570
.												
...	1200	--	8.9	70	<20	25	110	820	4.8	1620	135	1550
...	1045	1.3	9.3	10	10	31	120	830	3.7	1900	0	1560

09306255 YELLOW CREEK NEAR WHITE RIVER, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	DIS-SOLVED SULFIDE (S) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED NITRITE (N) (MG/L)	DIS-SOLVED AMMONIA NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHO. PHOSPHORUS (P) (MG/L)	TOTAL FILTRABLE RESIDUE (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
CT.												
25...	--	510	100	1.9	--	--	--	--	--	.02	--	2090
EC.												
11...	.0	560	140	2.3	--	--	.34	.82	.12	.07	3500	2590
23...	.5	560	120	2.3	2.2	.02	.24	.74	.14	.08	--	2510
AN.												
08...	.1	570	110	2.0	1.8	.02	.24	.75	.10	.07	--	2320
21...	.2	560	110	2.1	2.1	.02	.26	1.0	.15	.09	--	2280
EB.												
12...	.1	540	120	2.0	2.7	.04	.23	1.2	.07	.10	--	2390
27...	.0	560	110	2.2	1.8	.01	.40	.94	.22	.10	--	2400
AR.												
12...	.0	490	130	2.0	2.1	.00	.00	.17	.02	.05	2500	2320
26...	.1	640	110	1.9	1.5	.01	.17	.71	.13	.12	--	2450
PR.												
09...	.3	470	130	1.2	2.2	.01	.19	--	--	.11	--	2270
09...	.2	630	130	1.6	1.8	.01	.23	2.6	.79	.05	--	2740
23...	.1	600	120	2.1	.99	.01	.00	.60	.09	.04	--	2330
AY												
15...	.1	570	120	2.1	.57	.01	.06	.30	.04	.02	--	2430
28...	.0	560	100	2.0	.34	.01	.00	1.4	.10	.02	--	2250
UNE												
13...	.3	600	130	2.4	.01	.00	.01	.98	.01	.00	--	2540
26...	.3	580	130	2.4	.11	.02	.02	.45	.01	.01	--	2530
ULY												
16...	.1	540	110	1.8	.50	.01	.00	.86	.24	.00	--	2280
20...	.0	510	140	2.5	.99	.01	.04	.57	.03	.00	--	2550
UG.												
14...	.0	530	140	2.2	.28	.06	.00	.52	.05	.00	--	2520
29...	.0	480	140	2.4	.58	.07	.03	.47	.00	.00	--	2530
EP.												
10...	.0	510	150	2.3	.64	.06	.00	.89	.04	.00	--	2570
24...	.0	520	140	2.3	.77	.01	.03	.48	.04	.00	--	2600

DATE	TOTAL NON-FILTRABLE RESIDUE (MG/L)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	SODIUM AD-SORPTION RATIO	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DIS-SOLVED OXYGEN (MG/L)	CHEMICAL OXYGEN DEMAND (HIGH LEVEL) (MG/L)	CYANIDE (CN) (MG/L)
CT.												
25...	--	540	0	11	3110	8.6	12.0	--	--	--	--	--
DEC.												
11...	84	520	0	15	3500	8.5	.5	5	60	11.9	30	.00
23...	--	560	0	14	4000	8.6	1.5	10	70	11.5	--	.00
AN.												
08...	--	560	0	13	4000	8.3	3.0	3	4	10.6	--	.00
21...	--	490	0	13	3800	8.3	1.0	5	300	11.4	--	.00
EB.												
12...	--	610	0	13	3000	8.4	3.0	8	200	10.8	--	.00
27...	--	640	0	12	3450	8.4	1.0	20	300	8.3	--	.00
AR.												
12...	--	550	0	13	3500	8.4	9.0	3	3	8.5	7	.00
26...	--	650	0	12	3600	8.7	3.5	10	85	10.6	--	.00
PR.												
09...	--	500	0	13	3250	8.8	9.0	3	3	10.4	--	--
09...	--	590	0	15	3400	8.7	9.0	2	400	9.1	--	.00
23...	--	550	0	13	3500	8.8	9.0	4	56	9.6	--	.00
MAY												
15...	--	570	0	13	3000	8.7	17.0	3	18	7.6	--	.00
28...	--	500	0	13	3020	--	9.5	20	230	9.7	--	.00
JUNE												
13...	--	550	0	15	4000	9.4	22.0	20	23	8.6	22	.00
26...	--	500	0	15	4200	9.1	23.5	20	4	8.4	--	.00
JULY												
16...	--	500	0	14	3800	8.5	19.0	45	150	7.4	--	.00
20...	--	490	0	16	3500	8.9	17.0	20	12	11.0	--	.00
AUG.												
14...	--	510	0	15	4000	8.4	14.0	20	44	8.1	--	.00
29...	--	460	0	17	3500	8.6	17.0	20	45	9.9	--	.00
SEP.												
10...	--	520	0	16	4000	--	19.0	30	20	9.9	24	.00
24...	--	570	0	15	4000	8.1	8.5	10	20	12.2	--	.00

09306255 YELLOW CREEK NEAR WHITE RIVER, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	OIL AND GREASE (MG/L)	DISSOLVED ARSENIC (AS) (UG/L)	DISSOLVED BARIUM (BA) (UG/L)	DISSOLVED BORON (B) (UG/L)	DISSOLVED CADMIUM (CD) (UG/L)	DISSOLVED CHROMIUM (CR) (UG/L)	DISSOLVED COPPER (CU) (UG/L)	DISSOLVED LEAD (PB) (UG/L)	DISSOLVED LITHIUM (LI) (UG/L)	DISSOLVED MERCURY (HG) (UG/L)	DISSOLVED SELENIUM (SE) (UG/L)	DISSOLVED ZINC (ZN) (UG/L)
...	--	--	--	--	--	--	--	--	--	--	--	--
C.												
1...	0	5	160	230	<60	<20	<4	<20	170	<.1	3	<60
3...	2	4	<100	700	2	0	2	3	160	.1	1	140
...	17	3	200	590	0	0	0	3	140	.9	0	20
...	6	4	0	630	0	10	2	5	140	.0	3	30
B.												
12...	8	2	<100	880	1	0	6	3	150	.0	3	20
7...	8	0	400	640	0	0	1	2	120	.0	1	7
...	3	5	200	560	<170	<15	5	<16	160	.0	3	6
...	3	3	100	630	0	0	0	0	120	.0	2	0
R.												
09...	--	1	<100	680	0	0	3	0	120	.3	3	6
...	2	5	300	700	0	0	1	0	140	.0	3	20
3...	2	6	0	630	1	0	7	9	130	.0	1	0
15...	1	5	300	640	2	0	3	4	170	.2	1	6
28...	1	5	200	640	1	0	2	5	120	.0	3	30
NE												
3...	0	5	150	360	0	<17	<4	<17	140	.0	2	0
...	--	9	200	740	0	0	3	1	160	.0	2	10
ULY												
16...	1	6	400	670	1	0	4	0	130	.0	2	20
0...	1	4	0	690	1	0	4	2	160	.0	2	40
G.												
4...	0	6	400	720	0	0	2	1	160	.0	3	10
29...	0	5	200	790	1	0	5	2	180	.0	2	0
EP.												
0...	1	4	220	460	1	<20	7	<20	160	.0	2	0
4...	0	7	200	680	1	10	4	0	160	.0	2	10

DATE	FECAL COLIFORM (COL. PER 100 ML)	TOTAL ORGANIC CARBON (C) (MG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL HEPTACHLOR (UG/L)
DEC.											
11...	--	7.7	.00	.0	.00	.00	.00	.00	.00	.00	.00
MAR.											
12...	<1	4.7	.00	.0	.00	.00	.00	.00	.00	.00	.00
JUNE											
13...	--	15	.00	.0	.00	.00	.00	.00	.00	.00	.00
SEP.											
10...	140	29	.00	.0	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL PCB (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL SILVEX (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)
DEC.										
11...	.00	.00	.00	.00	.00	.0	0	.00	.00	.00
MAR.										
12...	.00	.00	.00	.00	.00	.0	0	.00	.00	.00
JUNE										
13...	.00	.00	.00	.00	.00	.0	0	.00	.00	.00
SEP.										
10...	.00	.00	.00	.00	.00	.0	0	.00	.00	.00

09306255 YELLOW CREEK NEAR WHITE RIVER, COLO.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED BERYL-LIUM (BE) (UG/L)	DIS-SOLVED BISMUTH (BI) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	DIS-SOLVED GALLIUM (GA) (UG/L)	DIS-SOLVED GER-MANIUM (GE) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)
DEC. 11...	90	<4	<20	<20	<8	<20	16	<15	<2	3600
MAR. 12...	150	<4	<15	<15	<5	<20	30	<10	<2	3500
JUNE 13...	70	<8	<17	<17	<8	<26	75	<17	<2	3300
SEP. 10...	75	<4	<20	<10	<10	<20	55	<20	<2	3000

DATE	DIS-SOLVED TIN (SN) (UG/L)	DIS-SOLVED TI-TANIUM (TI) (UG/L)	DIS-SOLVED VANA-DIUM (V) (UG/L)	DIS-SOLVED ZIR-CONIUM (ZR) (UG/L)	DIS-SOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUS-PENDED GROSS ALPHA AS U-NAT. (UG/L)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L)	SUS-PENDED GROSS BETA AS CS-137 (PC/L)	DIS-SOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUS-PENDED GROSS BETA AS SR90 /Y90 (PC/L)
DEC. 11...	<20	<12	<12	<30	<30	3.6	9.0	3.8	8.0	3.0
MAR. 12...	<15	<10	<8.0	<25	<36	--	10	--	8.8	--
JUNE 13...	<17	<8	<17	<26	--	--	--	--	--	--
SEP. 10...	<20	<10	<10	<40	--	--	--	--	--	--

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DATE	TIME	WATER TEM-PERA-TURE (°C)	DISCHARGE (CFS)	CONCEN-TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED										
						.002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00
JAN., 1975 21...	1100	1.0	2.2	652	3.9	62	81		--		98					
FEB. 27...	1100	1.0	2.3	215	1.3	--	--		--		92					
MAR. 12...	1400	9.0	2.4	2560	17	--	--		--		96					
26...	1130	3.5	2.2	319	1.9	--	--		--		78					
APR. 09...	1200	6.0	1.2	806	2.6	--	--		--		28					
09...	1220	9.0	2.8	1480	11	--	--		--		92					
09...	1245	9.0	3.4	2020	19	--	--		--		96					
MAY 15...	1100	17.0	1.7	58	.27	--	--		--		95					
28...	1225	9.5	1.7	358	1.6	--	--		--		82					
JUNE 13...	1230	22.0	1.5	143	.58	--	--		--		96					
26...	1330	23.5	1.1	44	.13	--	--		--		100					
AUG. 11...	2310	----	4.1	12,300	136	--	--		--		99					
SEPT. 11...	0230	12.5	7.9	2380	51	76	89		97		100					

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							2660	3140	3890	4150	3450	3790
2							3570	3050	3980	4030	3530	3770
3							3430	3070	3990	3900	3560	3810
4							3360	3140	4050	3300	3580	3620
5							3360	3230	4150	3300	3550	3850
6							2690	3360	---	3500	3530	3890
7							2610	3230	---	3600	3510	3920
8							2970	3180	---	---	3510	3950
9							3370	3200	---	---	2480	3980
10							2990	---	---	---	3470	---
11							2680	---	---	---	3300	2380
12							2750	---	---	---	3380	3180
13							2770	---	3080	---	3360	3400
14							2840	---	2950	---	3750	3110
15							2870	3000	2970	---	4050	3380
16							2990	---	3100	---	4020	3440
17							3310	---	3170	---	3960	3460
18							3340	---	3280	---	3960	3540
19							3190	---	3400	---	3950	3560
20							3440	---	3380	---	3900	3780
21							3360	---	3540	---	3860	3960
22							3450	---	4120	---	3840	3980
23							3480	---	4360	---	3860	3990
24							3180	---	4580	---	3880	4000
25							3140	---	4730	---	3850	3910
26							3120	---	---	---	3840	3750
27							3020	---	4310	---	3790	3640
28							3000	---	4360	---	3740	3700
29							3040	3020	4290	---	3780	3900
30							3150	3700	4230	---	3770	3790
31							---	3850	---	3710	3770	---
MONTH							3100	---	---	---	3670	3680

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	8.5	0.0	15.0	-0.5	29.5	9.0	29.0	9.0	30.0	12.5	24.5	9.0
2	9.0	0.0	19.5	1.0	28.0	10.0	30.5	10.5	27.5	7.0	26.0	11.5
3	13.0	0.0	23.0	0.0	25.0	12.0	30.5	12.5	28.5	7.0	27.0	6.5
4	14.5	0.0	16.0	2.0	29.5	12.5	30.5	15.0	28.5	7.5	27.5	8.0
5	18.5	0.0	14.0	0.5	30.5	10.5	33.0	14.0	28.0	9.0	27.0	7.5
6	17.5	0.5	15.0	0.0	---	12.0	31.5	14.5	27.0	10.5	25.0	7.0
7	8.5	1.5	12.0	1.0	---	---	32.5	16.0	24.5	12.5	24.5	8.5
8	13.5	0.0	18.5	2.5	---	---	35.0	20.5	27.5	9.5	20.0	12.5
9	12.5	0.0	16.0	0.5	---	---	30.5	20.5	29.0	8.0	24.0	12.0
10	18.0	0.5	21.5	0.0	---	---	31.5	17.5	27.5	10.0	---	13.5
11	17.0	3.5	23.0	2.0	---	---	31.5	17.0	24.5	14.5	19.5	11.5
12	18.0	2.5	15.0	6.5	---	---	30.5	15.5	28.0	11.5	25.0	9.5
13	21.5	0.5	26.0	3.0	28.5	17.0	26.5	16.0	24.0	11.0	20.0	13.0
14	17.5	1.0	29.0	3.0	28.5	13.0	27.0	9.0	25.0	10.0	24.5	12.0
15	16.0	3.5	22.0	4.0	29.0	10.5	19.0	13.5	28.0	11.0	25.0	10.0
16	19.0	2.0	20.0	4.0	26.5	12.5	---	---	26.5	13.0	23.0	10.5
17	13.0	0.0	22.5	6.5	20.5	10.5	---	---	27.0	12.5	23.0	11.5
18	14.5	1.5	19.0	6.5	14.5	9.0	---	---	26.0	9.5	23.0	8.5
19	19.0	0.5	18.0	4.5	21.5	5.5	---	---	26.0	8.5	21.5	5.0
20	18.5	3.0	17.0	5.0	16.5	7.0	---	---	21.0	11.5	20.0	3.5
21	21.0	2.0	10.0	2.0	23.0	6.5	---	---	20.5	23.0	20.0	3.5
22	22.5	3.5	15.0	3.5	23.5	7.0	---	---	21.0	10.0	20.0	2.5
23	21.0	4.0	21.5	1.0	25.0	8.5	---	---	25.0	10.0	21.5	2.5
24	22.5	3.0	26.5	4.0	25.0	9.0	25.5	14.5	24.0	9.5	21.5	2.5
25	20.0	2.5	27.5	7.0	20.5	7.5	24.5	11.5	24.0	6.5	20.0	1.5
26	13.5	4.5	29.5	2.0	28.0	6.0	24.0	11.0	26.5	7.5	18.0	2.5
27	14.5	3.5	23.5	7.5	26.0	6.0	23.5	11.5	21.0	10.0	20.0	3.5
28	17.5	3.0	---	8.5	28.0	9.0	23.5	13.0	26.0	10.5	19.5	1.0
29	15.5	0.0	---	---	27.5	8.5	22.0	14.5	25.0	7.5	19.0	1.5
30	17.0	0.0	28.0	13.0	29.0	8.0	23.5	17.0	27.5	7.0	20.0	4.0
31	---	---	26.5	9.5	---	---	24.5	13.5	26.5	8.0	---	---
MONTH	22.5	0.0	29.5	-0.5	---	5.5	---	---	30.0	6.5	27.5	1.0

09306255 YELLOW CREEK NEAR WHITE RIVER, COLO.--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	OCTOBER			NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	1.6	45	.19	1.8	54	.26	1.8	99	.48
2	1.6	45	.19	1.7	54	.25	2.0	108	.58
3	1.6	45	.19	1.7	63	.29	2.3	126	.78
4	1.6	45	.19	1.6	40	.17	2.4	135	.87
5	1.7	45	.21	1.5	68	.28	2.3	117	.73
6	1.7	45	.21	1.6	50	.22	2.2	108	.64
7	1.7	45	.21	1.6	90	.39	2.1	112	.64
8	1.7	45	.21	1.6	122	.53	2.1	117	.66
9	1.7	45	.21	1.6	189	.82	2.1	122	.69
10	1.6	45	.19	1.6	135	.58	2.1	126	.71
11	2.3	113	.05	1.5	81	.33	2.1	131	.74
12	1.7	81	.37	1.6	90	.39	2.2	131	.78
13	1.7	94	.43	1.6	90	.39	2.3	126	.78
14	1.7	90	.41	1.6	90	.39	2.4	135	.87
15	1.7	50	.23	1.6	90	.39	2.3	144	.89
16	1.7	54	.25	1.5	90	.36	1.3	117	.41
17	1.6	41	.18	1.4	90	.34	1.3	99	.35
18	1.6	72	.31	1.4	76	.29	1.3	108	.38
19	1.6	90	.39	1.4	70	.26	1.3	108	.38
20	1.6	90	.39	1.5	86	.35	1.3	112	.39
21	1.7	58	.27	1.7	99	.45	1.6	108	.47
22	1.7	72	.33	1.3	86	.30	1.6	108	.47
23	1.7	68	.31	1.2	74	.24	1.6	104	.45
24	1.7	45	.21	1.1	90	.27	1.6	104	.45
25	1.6	58	.25	1.0	59	.16	1.6	99	.43
26	1.8	68	.33	1.0	65	.18	1.6	99	.43
27	1.7	81	.37	1.1	72	.21	1.6	94	.41
28	1.7	122	.56	1.2	76	.25	1.6	94	.41
29	1.8	63	.31	1.5	86	.35	1.7	90	.41
30	1.7	54	.25	1.6	90	.39	1.8	90	.44
31	1.7	72	.33	---	---	---	1.8	86	.42

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.90	86	.21	1.7	585	2.7	3.0	3460	28
2	1.1	81	.24	1.5	540	2.2	3.5	5880	56
3	1.0	81	.22	1.5	585	2.4	3.0	5000	41
4	1.1	76	.23	1.4	565	2.2	2.8	5440	41
5	1.2	76	.25	1.3	540	1.9	2.7	2750	20
6	1.5	88	.36	1.2	540	1.7	3.0	2420	20
7	1.5	99	.40	1.5	540	2.2	2.5	2340	16
8	1.5	108	.44	2.0	585	3.2	2.4	2220	14
9	1.5	108	.44	2.4	585	3.8	2.1	2280	13
10	1.5	108	.44	2.4	585	3.8	2.3	2140	13
11	1.2	99	.32	2.1	585	3.3	2.4	2090	14
12	.96	90	.23	2.2	572	3.4	2.4	1890	12
13	1.1	99	.29	2.3	558	3.5	2.5	1690	11
14	1.5	108	.44	2.0	544	2.9	2.3	2280	14
15	1.7	135	.62	2.3	531	3.3	2.0	2020	11
16	1.8	180	.87	2.2	518	3.1	1.9	1560	8.0
17	2.0	270	1.5	2.0	504	2.7	1.8	1140	5.5
18	2.1	360	2.0	1.9	491	2.5	1.8	900	4.4
19	2.1	450	2.6	2.0	477	2.6	2.0	660	3.6
20	2.2	540	3.2	2.0	464	2.5	2.1	1050	6.0
21	2.2	585	3.5	2.0	450	2.4	2.2	900	5.3
22	2.0	567	3.1	2.1	436	2.5	2.2	808	4.8
23	1.9	472	2.4	2.3	423	2.6	2.5	675	4.5
24	1.7	310	1.4	2.4	410	2.7	2.7	510	3.7
25	1.5	612	2.5	2.4	396	2.6	2.2	360	2.1
26	1.4	585	2.2	2.2	378	2.2	2.2	262	1.6
27	1.4	565	2.2	2.5	435	2.9	1.0	385	1.0
28	1.4	540	2.0	2.6	354	2.5	1.1	1220	3.6
29	1.4	540	2.0	---	---	---	1.2	[illegible]	1.9
30	1.8	585	2.8	---	---	---	1.5	665	2.7
31	1.8	565	2.8	---	---	---	1.7	260	1.2

09306255 YELLOW CREEK NEAR WHITE RIVER, COLO.--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

	APRIL			MAY			JUNE		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	1.0	570	1.5	1.9	135	.69	1.3	40	.14
2	.98	660	1.7	1.9	81	.42	1.3	35	.12
3	.98	1200	3.2	1.8	63	.31	1.4	30	.11
4	1.1	660	2.0	1.8	61	.30	1.5	35	.14
5	1.1	605	1.8	2.1	106	.60	1.4	35	.13
6	1.2	495	1.6	2.1	64	.36	1.4	50	.19
7	1.2	330	1.1	2.0	48	.26	1.6	140	.60
8	1.2	275	.89	1.9	48	.25	1.9	400	2.1
9	1.9	263	.09	1.9	44	.23	1.8	375	1.8
10	2.3	400	2.5	1.8	52	.25	1.6	135	.58
11	2.1	475	2.7	1.8	38	.18	1.6	32	.14
12	2.0	208	1.1	1.8	36	.17	1.6	27	.12
13	2.0	158	.85	1.8	36	.17	1.4	38	.14
14	2.0	150	.81	1.7	30	.14	1.4	39	.15
15	2.0	148	.80	1.7	28	.13	1.2	52	.17
16	2.0	120	.65	1.6	26	.11	1.2	46	.15
17	2.2	125	.74	1.5	38	.15	1.2	45	.15
18	2.2	152	.90	1.6	40	.17	1.4	41	.15
19	2.0	122	.66	1.6	38	.16	1.4	67	.25
20	1.9	112	.57	1.6	54	.23	1.5	97	.39
21	1.9	80	.41	2.1	91	.52	1.4	125	.47
22	1.8	80	.39	1.9	131	.67	1.4	120	.45
23	1.8	75	.36	1.7	140	.64	1.2	110	.36
24	1.8	70	.34	1.5	64	.26	1.2	56	.18
25	1.7	82	.38	1.3	50	.18	1.1	37	.11
26	1.8	68	.33	1.2	52	.17	1.2	45	.15
27	1.9	74	.38	1.4	52	.20	1.1	39	.12
28	1.9	112	.57	1.7	200	.92	1.0	36	.10
29	2.0	133	.72	1.7	100	.46	.98	45	.12
30	1.9	140	.72	1.4	70	.26	.93	37	.09
31	---	---	---	1.2	60	.19	---	---	---

	JULY			AUGUST			SEPTEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.84	37	.08	1.2	525	1.7	.67	144	.26
2	.93	51	.13	.93	420	1.1	.67	129	.23
3	1.0	50	.14	.88	330	.78	.67	126	.23
4	2.5	297	.15	.80	250	.54	.67	140	.25
5	1.4	100	.38	.76	180	.37	.67	70	.13
6	1.4	50	.19	.73	140	.28	.70	65	.12
7	1.1	45	.13	.73	120	.24	.70	70	.13
8	1.0	35	.09	.73	105	.21	.73	120	.24
9	1.1	70	.21	.73	88	.17	.88	185	.44
10	1.4	245	.93	.73	75	.15	2.3	2170	2.0
11	1.1	170	.50	2.5	3270	8.1	2.8	1550	1.0
12	.88	45	.11	1.1	1700	5.0	1.3	530	1.9
13	.84	900	2.0	.98	294	.78	1.2	423	1.4
14	4.5	2560	2.8	.80	168	.36	1.5	408	1.7
15	2.7	6540	8.5	.76	165	.34	1.2	424	1.4
16	2.7	3000	1.6	.76	200	.41	1.1	398	1.2
17	2.0	425	2.3	.76	175	.36	1.1	238	.71
18	1.5	400	1.6	.73	184	.36	1.1	66	.20
19	1.3	350	1.2	.67	132	.24	1.1	58	.17
20	1.5	700	2.8	.73	124	.24	1.2	60	.19
21	1.2	840	2.7	.76	136	.28	1.2	63	.20
22	1.2	490	1.6	.76	128	.26	1.2	44	.14
23	1.0	320	.86	.73	122	.24	1.2	60	.19
24	1.0	65	.18	.67	116	.21	1.2	52	.17
25	.98	50	.13	.67	101	.18	1.2	52	.17
26	.98	75	.20	.70	108	.20	1.2	39	.13
27	.98	60	.16	.67	93	.17	1.2	42	.14
28	.98	40	.11	.67	93	.17	1.2	48	.16
29	.98	40	.11	.67	111	.20	1.2	45	.15
30	2.0	11100	8.1	.67	127	.23	1.2	42	.14
31	1.4	3040	11	.67	144	.26	---	---	---

ALLUVIAL AQUIFERS

SECTION 1.2.3

WET CHEMICAL AND SPECTROGRAPHIC ANALYSES, ALLUVIAL TEST HOLES

EXPLANATION -- WATER QUALITY COMPUTER OUTPUT SHEETS

1. Code Hole Description Data

Job # 741-40

Assigned project number for Rio Blanco Oil Shale Project by Wright Water Engineers, Inc.

X = Distance in feet, north of baseline 7200 feet Datum of the Colorado State Coordinate System

Y = Distance, in feet, east of the baseline 7200 feet Datum of the Colorado State Coordinate System

Z = Elevation in feet above sea of the core hole at ground surface

Date Drill Compl.

The date when drilling was completed on the Core Hole.

Conv. to Monitor

Date the Core Hole was converted to a Monitor Hole.

Aquifer 1:

Depth in feet to the top and bottom of the upper aquifer from G.L.

Aquifer 2:

Depth in feet to the top and bottom of the lower aquifer from G.C.

2. Sample Description Data

Date

Date water sample was collected.

Depth

Depth for Method 1: depth sample was collected during drilling.

Depth for Method 2: depth sample was collected during pumping test.

Depth for Method 3: the static water level of the hole when sampled.

Temp.

Field temperature of sample (^{o}F)

Lab Num.

Designation number assigned by the analyzing laboratory.

Method

- 0. Drilling soap sample
- 1. Drilling program sample
- 2. Pumping test program sample
- 3. Monitoring program sample
- 3A. Monitoring program sample, not representative of aquifer conditions

Aquifer Loc.

U	Sample from upper aquifer during drilling, pumping or monitoring
L	Sample from lower aquifer during pumping test or monitoring
C	Sample combination of upper and lower aquifer during drilling
A	Sample from alluvial aquifer

3. Wet -- Wet Chemical Analysis

Values are in milligrams per liter, except for:

Gross Alpha -- picocuries per liter
Gross Beta -- pirocuries per liter
pH -- standard pH values
Conductance -- micromhos per centimeter
Negative value indicate less than minimum detectable limit indicated
0.0 value -- not analyzed for using wet chemical analysis

4. Spectrographic - spectrographic analysis of 67 elements

All values are in milligrams per liter
0.0 means less than minimum detectable amount
99999.000 means major amount
***** is used in Water Quality Analysis Summary to indicate an element has not been analyzed above the minimum detectable limit.

```
SAMPLES          1         2         3         4         5         6         7         8         9        10        11        12

PLATINUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
POTASSIUM        1.000     1.000     0.100     0.100     0.100     2.000     1.000     0.100     1.000     0.100     0.0       1.000
PRASEODYMI       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
RADIUM           0.500     0.100     0.300     0.0       0.600     0.0       0.200     0.0       0.0       0.0       0.0       0.0
RHENIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
RHODIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
RUBIDIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
RUTHENIUM        0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
SAMARIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
SCANDIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
SELENIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
SILICON          5.000    10.000     5.000     5.000     5.000     2.000     5.000     2.000 99999.000     5.000     0.0       5.000
SILVER           0.0       0.0       0.0       0.001     0.0       0.0       0.0       0.001     0.0       0.100     0.0       0.010
SODIUM          10.000 99999.000     5.000     5.000    10.000    10.000     5.000 99999.000     2.000     0.0       0.0      10.000
STRONTIUM        0.100     0.100     0.100     0.100     0.100     0.100     0.100     0.100     0.100     0.100     0.0       1.000
TANTALUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
TERBIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
THALLIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
THORIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
THULIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
TIN              0.0       0.001     0.0       0.0       0.0       0.0       0.0       0.0       0.001     0.001     0.0       0.001
TITANIUM         0.0       0.010     0.010     0.001     0.001     0.001     0.005     0.001     1.000     0.010     0.0       0.010
TUNGSTEN         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
URANIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
VANADIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.020     0.0       0.0       0.001
YTTERBIUM        0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
YTTRIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
ZINC             0.0       0.001     0.001     0.001     0.001     0.001     0.001     0.010     0.020     0.0       0.0       0.001
ZIRCONIUM        0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.010     0.0       0.0       0.0
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JOB#-741-40          OWNER-RIO BLANCO OIL SHALE PROJECT LOCATIONS: X-      0.0  Y-      0.0  Z-      0.0
DATE DRILL COMPL- 62175  DATE CONV TO MONITOR- 62175  AQUIFER 1:    0.0 -   0.0 FT  AQUIFER 2:    0.0 -   0.0 FT


SAMPLES             13         14         15         16

DATE             82976     111476      20177      41977
DEPTH            58.18      49.11      55.17      55.96
TEMP              51.4       46.5       48.6       50.3
LAB ID
LAB NUM           2144       4348       5902       7961
METHOD               3          3          3          3
AQUIF.LOC.           A          A          A          A

WET

ALUMINUM       0.0       -0.100      0.200      0.0
AMMONIA        2.000      0.0        0.0        0.0
ARSENIC        0.0       -0.010      0.0        0.0
BICARBONAT   380.000    415.000    560.000    565.000
CADMIUM        0.0       -0.010     -0.010      0.0
CALCIUM      110.000     82.000     98.000     33.000
CARBONATE     36.000     96.000     -0.100     -0.100
CHLORIDE      11.000     41.000     11.000     16.000
CHROMIUM       0.0       -0.010     -0.010      0.0
COPPER         0.0       -0.100     -0.100      0.0
FLUORIDE       0.100      0.200      0.200      0.200
HYDROXIDE      0.0        0.0        0.0        0.0
IRON          -0.050      0.050      0.080     -0.050
LEAD           0.0        0.040      0.040      0.0
MAGNESIUM     65.000    115.000     75.000    135.000
MERCURY        0.0       -0.010     -0.001      0.0
NITRATE       59.000      0.0        4.800      6.200
PHOSPHATE      0.600      0.100      0.100      0.100
POTASSIUM      6.500      8.500      3.000      2.700
SELENIUM       0.0       -0.010     -0.010      0.0
SIL DIOXID    16.000     28.000     31.000     22.000
SODIUM       180.000    200.000    220.000    155.000
SULFATE      520.000    500.000    510.000    450.000
SULFIDE        0.0        0.400      0.0        0.0
ZINC           0.0       -0.100     -0.100      0.0
GROS ALPHA     0.0        3.600      0.0        0.0
GROSS BETA     0.0        3.000      0.0        0.0
HARDNESS       0.0      685.000    550.000      0.0
PH             6.600      6.200      0.0        0.0
CONDUCTANC  1530.000   1720.000   1550.000      0.0
DIS SOLIDS  1220.000   1230.000   1280.000      0.0
MANGANESE      0.0       -0.050      0.800      0.0
ALKALINITY   340.000    420.000    460.000      0.0
CYANIDE        0.0       -0.010      0.0        0.0
BORON          0.100      0.300      0.200      0.0
BARIUM         0.0        0.0        0.0        0.0
SILVER         0.0        0.0        0.0        0.0
NICKEL         0.0        0.0        0.0        0.0
LITHIUM        0.0       -0.100     -0.100      0.0
DOC            0.0        0.0        0.0        0.0
NITRITE-N      0.0        5.200      0.040      0.200
BROMIDE        0.0       -0.100     -0.100      0.0
```

SAMPLES	13	14	15	16
C.O.D.	0.0	22.000	9.900	0.0
PHENOLS	0.0	-0.001	0.0	0.0
KJELDAHL N	5.400	2.000	2.700	16.000
BERYLLIUM	0.0	0.0	0.0	0.0
MOLYBDENUM	0.0	-0.100	-0.100	0.0
STRONTIUM	0.0	5.800	2.800	0.0
VANADIUM	0.0	0.0	0.0	0.0
ORTHO PHOS	0.100	-0.100	-0.100	0.100
AMMONIA-N	0.0	0.100	0.200	2.200
DIS-ORG C	0.0	0.0	6.500	0.0
MBAS	0.0	0.0	0.0	0.0
TOT COLIF	0.0	0.0	0.0	0.0
FEC COLIF	0.0	0.0	0.0	0.0
5-DAY B.O.	0.0	0.0	0.0	0.0
SPECTROGRAPHIC				
ALUMINUM	0.0	0.100	0.500	0.0
ANTIMONY	0.0	0.0	0.0	0.0
ARSENIC	0.0	0.0	0.0	0.0
BARIUM	0.0	0.0	0.0	0.0
BERYLIUM	0.0	0.0	0.0	0.0
BISMUTH	0.0	0.0	0.0	0.0
BORON	0.0	0.500	0.500	0.0
CADMIUM	0.0	0.0	0.0	0.0
CALCIUM	0.0	99999.000	99999.000	0.0
CERIUM	0.0	0.0	0.0	0.0
CESIUM	0.0	0.0	0.0	0.0
CHROMIUM	0.0	0.0	0.0	0.0
COBALT	0.0	0.0	0.0	0.0
COLUMBIUM	0.0	0.0	0.0	0.0
COPPER	0.0	0.010	0.010	0.0
DYSPROSIUM	0.0	0.0	0.0	0.0
ERBIUM	0.0	0.0	0.0	0.0
EUROPIUM	0.0	0.0	0.0	0.0
GADOLINIUM	0.0	0.0	0.0	0.0
GALLIUM	0.0	0.0	0.0	0.0
GERMANIUM	0.0	0.0	0.0	0.0
GOLD	0.0	0.0	0.0	0.0
HAFNIUM	0.0	0.0	0.0	0.0
HOLMIUM	0.0	0.0	0.0	0.0
INDIUM	0.0	0.0	0.0	0.0
IRIDIUM	0.0	0.0	0.0	0.0
IRON	0.0	0.050	0.200	0.0
LANTHANUM	0.0	0.0	0.0	0.0
LEAD	0.0	0.0	0.001	0.0
LITHIUM	0.0	0.0	0.0	0.0
LUTETIUM	0.0	0.0	0.0	0.0
MAGNESIUM	0.0	99999.000	99999.000	0.0
MANGANESE	0.0	0.010	0.200	0.0
MERCURY	0.0	0.0	0.0	0.0
MOLYBDENUM	0.0	0.020	0.010	0.0
NEODYMIUM	0.0	0.0	0.0	0.0
NICKEL	0.0	0.0	0.0	0.0
OSMIUM	0.0	0.0	0.0	0.0
PALLADIUM	0.0	0.0	0.0	0.0

```
SAMPLES             13          14          15          16

PLATINUM           0.0         0.0         0.0         0.0
POTASSIUM          0.0         0.010       0.010       0.0
PRASEODYMI         0.0         0.0         0.0         0.0
RADIUM             0.0         0.0         0.0         0.0
RHENIUM            0.0         0.0         0.0         0.0
RHODIUM            0.0         0.0         0.0         0.0
RUBIDIUM           0.0         0.0         0.0         0.0
RUTHENIUM          0.0         0.0         0.0         0.0
SAMARIUM           0.0         0.0         0.0         0.0
SCANDIUM           0.0         0.0         0.0         0.0
SELENIUM           0.0         0.0         0.0         0.0
SILICON            0.0         5.000       0.0         0.0
SILVER             0.0         0.001       0.0         0.0
SODIUM             0.0     99999.000       0.0         0.0
STRONTIUM          0.0         0.100       0.0         0.0
TANTALUM           0.0         0.0         0.0         0.0
TERBIUM            0.0         0.0         0.0         0.0
THALLIUM           0.0         0.0         0.0         0.0
THORIUM            0.0         0.0         0.0         0.0
THULIUM            0.0         0.0         0.0         0.0
TIN                0.0         0.0         0.0         0.0
TITANIUM           0.0         0.0         0.0         0.0
TUNGSTEN           0.0         0.0         0.0         0.0
URANIUM            0.0         0.0         0.0         0.0
VANADIUM           0.0         0.0         0.0         0.0
YTTERBIUM          0.0         0.0         0.0         0.0
YTTRIUM            0.0         0.0         0.0         0.0
ZINC               0.0         0.0         0.0         0.0
ZIRCONIUM          0.0         0.0         0.0         0.0
```

```
SAMPLES              1          2          3          4          5          6          7          8          9         10         11         12

C.O.D.             0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      5.000     14.000      0.0
PHENOLS            0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0     -0.001     -0.001      0.0
KJELDAHL N         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      5.300      2.000     -0.100
BERYLLIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0       -0.020      0.0
MOLYBDENUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0        0.0        0.0
STRONTIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0        0.0        0.0
VANADIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0        0.0        0.0
ORTHO PHOS         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0       -0.100     -0.100
AMMONIA-N          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0        0.0        0.900
DIS-ORG C          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0        0.0        2.000
MBAS               0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0        0.0        0.0
TOT COLIF          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0        0.0        0.0
FEC COLIF          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0        0.0        0.0
5-DAY B.O.         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0      0.0        0.0        0.0

SPECTROGRAPHIC

ALUMINUM           0.005      0.500      0.010      0.050      0.100      1.000      0.100      0.500      0.500      0.0        0.010      0.0
ANTIMONY           0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
ARSENIC            0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
BARIUM             0.001      0.001      0.0        0.0        0.001      0.010      0.001      0.0        0.001      0.0        0.0        0.0
BERYLIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
BISMUTH            0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
BORON              0.500      0.500      0.200      0.500      0.500      0.500      0.500      0.020      0.100      0.0        0.200      0.0
CADMIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
CALCIUM        99999.000  99999.000  99999.000  99999.000  99999.000  99999.000  99999.000  99999.000  99999.000      0.0    99999.000      0.0
CERIUM             0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
CESIUM             0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
CHROMIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.001      0.001      0.0        0.0        0.0
COBOLT             0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
COLUMBIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
COPPER             0.005      0.010      0.005      0.005      0.001      0.010      0.005      0.050      0.020      0.0        0.010      0.0
DYSPROSIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
ERBIUM             0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
EUROPIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GADOLINIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GALLIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.001      0.0        0.0        0.0
GERMANIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GOLD               0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
HAFNIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
HOLMIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
INDIUM             0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
IRIDIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
IRON               0.050      0.100      0.010      0.020      0.010      0.500      0.050      0.500      0.200      0.0        0.001      0.0
LANTHANUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
LEAD               0.0        0.0        0.0        0.0        0.0        0.001      0.0        0.100      0.010      0.0        0.010      0.0
LITHIUM            0.010      0.001      0.0        0.010      0.010      0.001      0.001      0.010      0.001      0.0        0.0        0.0
LUTETIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
MAGNESIUM      99999.000  99999.000  99999.000  99999.000  99999.000  99999.000  99999.000  99999.000  99999.000      0.0    99999.000      0.0
MANGANESE          0.001      0.050      0.001      0.010      0.010      0.100      0.050      0.100      0.100      0.0        0.0        0.0
MERCURY            0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
MOLYBDENUM         0.0        0.0        0.001      0.0        0.0        0.010      0.001      0.001      0.001      0.0        0.010      0.0
NEODYMIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
NICKEL             0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
OSMIUM             0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
PALLADIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
```

SAMPLES	1	2	3	4	5	6	7	8	9	10	11	12
PLATINUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POTASSIUM	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.100	0.100	0.0	0.100	0.0
PRASEODYMI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RADIUM	0.500	0.0	0.400	0.100	0.400	0.200	0.400	0.0	0.0	0.0	0.0	0.0
RHENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RHODIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RUBIDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RUTHENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SAMARIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SCANDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SELENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SILICON	2.000	5.000	2.000	2.000	5.000	5.000	5.000	5.000	5.000	0.0	5.000	0.0
SILVER	0.0	0.001	0.0	0.0	0.0	0.001	0.001	0.005	0.001	0.0	0.001	0.0
SODIUM	10.000	99999.000	10.000	10.000	10.000	10.000	5.000	10.000	5.000	0.0	0.0	0.0
STRONTIUM	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.0	0.100	0.0
TANTALUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THALLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THORIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THULIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIN	0.0	0.001	0.0	0.0	0.0	0.0	0.0	0.0	0.001	0.0	0.0	0.0
TITANIUM	0.001	0.001	0.0	0.001	0.001	0.001	0.010	0.050	0.100	0.0	0.001	0.0
TUNGSTEN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VANADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.001	0.0	0.0	0.0	0.0
YTTERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YTTRIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ZINC	0.0	0.001	0.0	0.0	0.0	0.001	0.0	0.010	0.010	0.0	0.0	0.0
ZIRCONIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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JOB#-741-40          OWNER-RIO BLANCO OIL SHALE PROJECT LOCATIONS: X-      0.0  Y-      0.0  Z-      0.0
DATE DRILL COMPL- 61975  DATE CONV TO MONITOR- 62075  AQUIFER 1:    0.0 -    0.0 FT  AQUIFER 2:    0.0 -    0.0 FT


SAMPLES            13        14        15        16        17        18        19

DATE            73176     82976     92476    111476     20177     41977     50977
DEPTH           65.06     65.40     67.40     65.47     65.38     64.19     72.50
TEMP             54.0      49.1      48.0      48.0      46.0      48.2      51.6
LAB ID
LAB NUM          1505      2145      3943      4349      5903      7962      8443
METHOD              3         3         3         3         3         3         3
AQUIF.LOC.          A         A         A         A         A         A         A

WET

ALUMINUM        0.0       0.0       0.0      -0.100     0.100     0.0       0.0
AMMONIA         0.0       0.400     0.0       0.0       0.0       0.0       0.0
ARSENIC         0.0       0.0       0.0      -0.010     0.0       0.0       0.0
BICARBONAT    615.000   565.000   640.000   510.000   670.000   675.000   690.000
CADMIUM         0.0       0.0       0.0      -0.010    -0.010     0.0       0.0
CALCIUM        69.000    84.000   100.000    67.000    85.000    36.000    59.000
CARBONATE      -0.100    42.000    -0.100   120.000    -0.100    -0.100    -0.100
CHLORIDE       31.000     9.900    21.000    41.000    15.000    15.000    19.000
CHROMIUM        0.0       0.0       0.0      -0.010    -0.010     0.0       0.0
COPPER          0.0       0.0       0.0      -0.100    -0.100     0.0       0.0
FLUORIDE        0.400     0.200     0.500     0.300     0.400     0.300     0.400
HYDROXIDE       0.0       0.0       0.0       0.0       0.0       0.0       0.0
IRON           -0.050    -0.050    -0.050     0.090    -0.050    -0.050    -0.050
LEAD            0.0       0.0       0.0       0.060     0.080     0.0       0.0
MAGNESIUM     135.000   135.000   120.000   140.000   130.000   160.000   145.000
MERCURY         0.0       0.0       0.0      -0.001    -0.001     0.0       0.0
NITRATE         2.900     4.400     0.0       0.0       2.900     2.500     2.200
PHOSPHATE       0.200     0.100     0.200     0.200     0.100     0.400     0.0
POTASSIUM       3.800     6.500     6.000    13.000     3.300     2.700     4.000
SELENIUM        0.0       0.0       0.0      -0.010    -0.010     0.0       0.0
SIL DIOXID     29.000    17.000    28.000    28.000    27.000    22.000    21.000
SODIUM        270.000   190.000   280.000   250.000   205.000   210.000   220.000
SULFATE       655.000   580.000   710.000   550.000   580.000   550.000   600.000
SULFIDE         0.0       0.0       0.0       0.600    -0.100     0.0       0.0
ZINC            0.0       0.0       0.0      -0.100     0.100     0.0       0.0
GROS ALPHA      0.0       0.0       0.0      11.600     3.300     0.0       0.0
GROSS BETA      0.0       0.0       0.0       7.000     0.0       0.0       0.0
HARDNESS      730.000     0.0     745.000   735.000   760.000   750.000   740.000
PH              6.800     6.800     0.0       6.000     0.0       6.700     6.400
CONDUCTANC   1900.000  1900.000     0.0    1850.000  2000.000  1085.000  1180.000
DIS SOLIDS   1410.000  1430.000  1410.000  1420.000  1450.000  1400.000  1280.000
MANGANESE      -0.050     0.0       0.060    -0.050    -0.050    -0.050    -0.050
ALKALINITY   1505.000   495.000   525.000   515.000   550.000   555.000   565.000
CYANIDE         0.0       0.0       0.0      -0.010    -0.010     0.0       0.0
BORON           0.0       3.600     0.100     0.500     0.200     0.300     0.200
BARIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0
SILVER          0.0       0.0       0.0       0.0       0.0       0.0       0.0
NICKEL          0.0       0.0       0.0       0.0       0.0       0.0       0.0
LITHIUM         0.0       0.0       0.0      -0.100    -0.100     0.0       0.0
DOC             6.000     0.0       6.000     8.000     0.0       6.000    10.000
NITRITE-N      -0.010     0.0       0.300     2.400     0.030     0.040    -0.010
BROMIDE         0.0       0.0       0.0       0.400    -0.100     0.0       0.0
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SAMPLES            13         14         15         16         17         18         19

C.O.D.            0.0        0.0        0.0       20.000      5.000      0.0        0.0
PHENOLS           0.0        0.0        0.0        0.005     -0.001      0.0        0.0
KJELDAHL N       -0.100      6.100      6.100     -0.100      0.700     -0.100      0.700
BERYLLIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
MOLYBDENUM        0.0        0.0        0.0       -0.100     -0.100      0.0        0.0
STRONTIUM         0.0        0.0        0.0        6.500      3.600      0.0        0.0
VANADIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0
ORTHO PHOS       -0.100     -0.100     -0.100     -0.100     -0.100      0.100     -0.100
AMMONIA-N        -0.100      0.0        0.300     -0.100      0.400     -0.100      0.600
DIS-ORG C         0.0        0.0        0.0        0.0        6.300      0.0        0.0
MBAS             -0.010      0.0        0.0        0.0        0.0        0.0        0.0
TOT COLIF        60.000      0.0        0.0        0.0        0.0        0.0        0.0
FEC COLIF       -10.000      0.0        0.0        0.0        0.0        0.0        0.0
5-DAY B.O.        0.0        0.0        0.0        0.0        0.0        0.0        0.0

SPECTROGRAPHIC

ALUMINUM          0.010      0.0        0.0        0.010      0.001      0.0        0.0
ANTIMONY          0.0        0.0        0.0        0.0        0.0        0.0        0.0
ARSENIC           0.0        0.0        0.0        0.0        0.0        0.0        0.0
BARIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0
BERYLIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0
BISMUTH           0.0        0.0        0.0        0.0        0.0        0.0        0.0
BORON             0.200      0.0        0.0        0.500      0.500      0.0        0.0
CADMIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0
CALCIUM       99999.000      0.0        0.0    99999.000  99999.000      0.0        0.0
CERIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0
CESIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0
CHROMIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0
COBOLT            0.0        0.0        0.0        0.0        0.0        0.0        0.0
COLUMBIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
COPPER            0.001      0.0        0.0        0.001      0.001      0.0        0.0
DYSPROSIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0
ERBIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0
EUROPIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0
GADOLINIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GALLIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0
GERMANIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
GOLD              0.0        0.0        0.0        0.0        0.0        0.0        0.0
HAFNIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0
HOLMIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0
INDIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0
IRIDIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0
IRON              0.010      0.0        0.0        0.010      0.001      0.0        0.0
LANTHANUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
LEAD              0.0        0.0        0.0        0.0        0.005      0.0        0.0
LITHIUM           0.0        0.0        0.0        0.0        0.0        0.0        0.0
LUTETIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0
MAGNESIUM     99999.000      0.0        0.0    99999.000  99999.000      0.0        0.0
MANGANESE         0.0        0.0        0.0        0.001      0.0        0.0        0.0
MERCURY           0.0        0.0        0.0        0.0        0.0        0.0        0.0
MOLYBDENUM        0.010      0.0        0.0        0.020      0.010      0.0        0.0
NEODYMIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
NICKEL            0.0        0.0        0.0        0.0        0.0        0.0        0.0
OSMIUM            0.0        0.0        0.0        0.0        0.0        0.0        0.0
PALLADIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
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SAMPLES            13        14        15        16        17        18        19

PLATINUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0
POTASSIUM        0.010     0.0       0.0       0.010     0.010     0.0       0.0
PRASEODYMI       0.0       0.0       0.0       0.0       0.0       0.0       0.0
RADIUM           0.0       0.0       0.0       0.0       0.0       0.0       0.0
RHENIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0
RHODIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0
RUBIDIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0
RUTHENIUM        0.0       0.0       0.0       0.0       0.0       0.0       0.0
SAMARIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0
SCANDIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0
SELENIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0
SILICON          2.000     0.0       0.0       5.000     0.0       0.0       0.0
SILVER           0.0       0.0       0.0       0.0       0.0       0.0       0.0
SODIUM           5.000     0.0       0.0   99999.000     0.0       0.0       0.0
STRONTIUM        0.100     0.0       0.0       0.100     0.0       0.0       0.0
TANTALUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0
TERBIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0
THALLIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0
THORIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0
THULIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0
TIN              0.0       0.0       0.0       0.0       0.0       0.0       0.0
TITANIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0
TUNGSTEN         0.0       0.0       0.0       0.0       0.0       0.0       0.0
URANIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0
VANADIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0
YTTERBIUM        0.0       0.0       0.0       0.0       0.0       0.0       0.0
YTTRIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0
ZINC             0.0       0.0       0.0       0.0       0.0       0.0       0.0
ZIRCONIUM        0.0       0.0       0.0       0.0       0.0       0.0       0.0
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JOB#-741-40          OWNER-RIO BLANCO OIL SHALE PROJECT LOCATIONS: X-      0.0  Y-      0.0  Z-      0.0
DATE DRILL COMPL- 62075  DATE CONV TO MONITOR- 62075  AQUIFER 1:    0.0 -    0.0 FT  AQUIFER 2:    0.0 -    0.0 FT


SAMPLES             1          2          3          4          5          6          7          8          9         10         11         12

DATE            63075      71575      80575      83075     100975     112075     121275      12876      21876      41376      52076      62276
DEPTH           28.50      30.44      30.75      28.81      29.22      30.28      29.35      29.04      28.82      28.55      28.45      28.62
TEMP             50.9       55.0       50.9       49.1       49.1       46.9       48.9       46.6       46.2       46.5       50.9       53.0
LAB ID
LAB NUM          2267       1548       2054       2770       3448       4662       5241       6305       6763       8372       9530        647
METHOD              3          3          3          3          3          3          3          3          3          3          3          3
AQUIF.LOC.          A          A          A          A          A          A          A          A          A          A          A          A

WET

ALUMINUM       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.100      0.0        0.0
AMMONIA        0.0        0.300     -0.100      0.200     -0.100      0.200     -0.100      0.800      1.100      2.000      0.600      0.0
ARSENIC       -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010      0.0
BICARBONAT   600.000    525.000    590.000    605.000    590.000    600.000    600.000    600.000    600.000    530.000    620.000    615.000
CADMIUM       -0.010      0.010     -0.010     -0.010     -0.010      0.050     -0.010      0.020      0.010     -0.010      0.080      0.0
CALCIUM       96.000     84.000     84.000     50.000    110.000    170.000    130.000     90.000     88.000    130.000     62.000     62.000
CARBONATE     -0.100     -0.100     -0.100     -0.100     -0.010     -0.100     -0.100     -0.100     -0.100     18.000     -0.100     -0.100
CHLORIDE      11.000     22.000     12.000     14.000     14.000     16.000     27.000     13.000     19.000     14.000     20.000     31.000
CHROMIUM      -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010      0.100     -0.010      0.0
COPPER        -0.100     -0.100      0.300      0.200      0.200     -0.100      1.000      0.400      0.400      0.800     -0.100      0.0
FLUORIDE       0.100      0.400      0.400      0.200      0.700      0.300      0.400      0.200      0.200      0.600      0.200      0.200
HYDROXIDE      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
IRON           0.500     17.700      0.600      1.000      1.100      0.800      8.800      1.200      7.800      0.080     -0.050     -0.050
LEAD           0.040      0.040      0.300      0.300      0.070      0.090      0.200      0.200      0.090      0.300      0.040      0.0
MAGNESIUM    120.000    105.000    130.000    135.000    130.000     67.000    100.000    130.000    110.000    110.000    145.000    135.000
MERCURY       -0.002     -0.002     -0.002     -0.002     -0.002     -0.001     -0.001     -0.001     -0.001     -0.001     -0.001      0.0
NITRATE       -0.100      1.600      4.500      2.900      4.400      2.300      2.800      2.800      4.000      0.700      3.100      4.600
PHOSPHATE     -0.100     -0.100     -0.100     -0.100     -0.100      0.200     -0.100     -0.100      0.100     -0.100      1.200      1.600
POTASSIUM      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        2.500     -1.000     14.000
SELENIUM      -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010      0.0
SIL DIOXID    32.000     44.000     34.000     28.000     27.000     30.000     28.000     29.000     28.000     27.000     28.000     28.000
SODIUM       160.000    220.000    150.000    220.000    180.000    230.000    230.000    165.000    220.000    160.000    170.000    200.000
SULFATE      510.000    550.000    510.000    580.000    630.000    600.000    600.000    560.000    600.000    680.000    510.000    600.000
SULFIDE        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0       -0.100     -0.100      0.0
ZINC           0.400      2.600      0.100      0.100     -0.100      0.100      0.700      0.200      0.200      0.600     -0.100      0.0
GROS ALPHA     3.300     16.000      8.500     10.000      9.300     23.000     25.000      8.900      0.0        0.0        0.0        0.0
GROSS BETA     0.0        0.0        0.0       18.000      0.0       27.000     12.000      2.000      0.0        0.0        0.0        0.0
HARDNESS     730.000    650.000    750.000    685.000    800.000    700.000    750.000    750.000    660.000      0.0      745.000    715.000
PH             7.000      7.000      6.800      6.100      6.100      6.000      6.000      6.100      6.100      6.500      6.600      6.900
CONDUCTANC  2275.000   1920.000   1680.000   1780.000   1670.000   1730.000   1770.000   1904.000   1760.000   1780.000   1850.000   1540.000
DIS SOLIDS  1220.000   1300.000   1210.000   1320.000   1390.000   1410.000   1450.000   1260.000   1420.000   1430.000   1380.000   1500.000
MANGANESE      0.200     13.000      0.300     -0.050     -0.050      5.500      5.200      0.300      1.000      0.100      0.060     -0.050
ALKALINITY   490.000    430.000    485.000    495.000    480.000    495.000    490.000    490.000    490.000    450.000    510.000    505.000
CYANIDE       -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010     -0.010      0.0
BORON          0.900      0.100      0.600      0.600      0.300      0.100      0.100     -0.100      0.100      0.030      0.100     -0.100
BARIUM        -1.000     -1.000     -1.000     -1.000     -1.000     -1.000     -1.000     -1.000     -1.000      0.0        0.0        0.0
SILVER        -0.010     -0.010     -0.010     -0.010     -0.010     -0.010      0.010      0.040      0.010      0.0        0.0        0.0
NICKEL         0.010      0.030      0.020      0.030      0.070      0.200      0.200      0.050      0.060      0.0        0.0        0.0
LITHIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0       -0.100     -0.100      0.0
DOC           44.000     75.000     10.000     20.000      7.000     90.000     42.000      8.000      0.0        3.800      0.0        0.0
NITRITE-N      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0       -0.020     -0.100     -0.100
BROMIDE        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.900      0.0        0.0
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SAMPLES            1         2         3         4         5         6         7         8         9        10        11        12

C.O.D.             0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       2.500    12.000     0.0
PHENOLS            0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0      -0.001    -0.001     0.0
KJELDAHL N         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       2.700     1.100    -0.100
BERYLLIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.400     0.0
MOLYBDENUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
STRONTIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
VANADIUM           0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
ORTHO PHOS         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       1.000    -0.100
AMMONIA-N          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.600
DIS-ORG C          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       2.000
MBAS               0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
TOT COLIF          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
FEC COLIF          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
5-DAY B.O.         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0

SPECTROGRAPHIC

ALUMINUM           0.050     0.500     0.050     0.010     0.010     0.500     0.500     0.500     0.500     0.0       0.010     0.0
ANTIMONY           0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
ARSENIC            0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
BARIUM             0.0       0.0       0.0       0.001     0.0       0.001     0.010     0.001     0.001     0.0       0.0       0.0
BERYLIUM           0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
BISMUTH            0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
BORON              0.200     0.500     0.500     0.200     0.500     0.500     0.500     0.020     0.500     0.0       0.500     0.0
CADMIUM            0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
CALCIUM        99999.000 99999.000 99999.000 99999.000 99999.000 99999.000 99999.000 99999.000 99999.000     0.0   99999.000     0.0
CERIUM             0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
CESIUM             0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
CHROMIUM           0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.001     0.001     0.0       0.0       0.0
COBALT             0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
COLUMBIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
COPPER             0.010     0.010     0.010     0.010     0.010     0.010     0.020     0.050     0.050     0.0       0.050     0.0
DYSPROSIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
ERBIUM             0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
EUROPIUM           0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
GADOLINIUM         0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
GALLIUM            0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
GERMANIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
GOLD               0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
HAFNIUM            0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
HOLMIUM            0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
INDIUM             0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
IRIDIUM            0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
IRON               0.050     0.020     0.020     0.050     0.020     0.100     0.050     0.200     0.200     0.0       0.001     0.0
LANTHANUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
LEAD               0.0       0.0       0.0       0.0       0.0       0.0       0.001     0.100     0.020     0.0       0.500     0.0
LITHIUM            0.001     0.010     0.010     0.001     0.001     0.001     0.001     0.010     0.001     0.0       0.0       0.0
LUTETIUM           0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
MAGNESIUM      99999.000 99999.000 99999.000 99999.000 99999.000 99999.000 99999.000 99999.000 99999.000     0.0   99999.000     0.0
MANGANESE          0.005     0.050     0.005     0.010     0.001     0.050     0.100     0.100     0.050     0.0       0.0       0.0
MERCURY            0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
MOLYBDENUM         0.0       0.001     0.0       0.001     0.001     0.001     0.0       0.001     0.010     0.0       0.020     0.0
NEODYMIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
NICKEL             0.0       0.0       0.0       0.0       0.070     0.0       0.0       0.0       0.0       0.0       0.0       0.0
OSMIUM             0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
PALLADIUM          0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
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WATER QUALITY ANALYSIS RESULTS -- CORE HOLE ID G-S S-23

SAMPLES	1	2	3	4	5	6	7	8	9	10	11	12
PLATINUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POTASSIUM	0.100	1.000	1.000	0.100	1.000	1.000	1.000	0.010	0.010	0.0	0.100	0.0
PRASEODYMI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RADIUM	0.0	0.100	0.200	0.0	0.200	0.100	0.300	0.0	0.0	0.0	0.0	0.0
RHENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RHODIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RUBIDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RUTHENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SAMARIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SCANDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SELENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SILICON	5.000	10.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	0.0	5.000	0.0
SILVER	0.0	0.001	0.0	0.0	0.0	0.0	0.0	0.010	0.0	0.0	0.0	0.0
SODIUM	5.000	99999.000	99999.000	2.000	5.000	10.000	5.000	5.000	5.000	0.0	10.000	0.0
STRONTIUM	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.0	0.100	0.0
TANTALUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THALLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THORIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THULIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TITANIUM	0.001	0.010	0.0	0.001	0.0	0.001	0.001	0.010	0.100	0.0	0.001	0.0
TUNGSTEN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VANADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.001	0.0	0.0	0.0	0.0
YTTERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YTTRIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ZINC	0.001	0.0	0.001	0.0	0.001	0.0	0.0	0.010	0.010	0.0	0.0	0.0
ZIRCONIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

JOB#-741-40 OWNER-RIO BLANCO OIL SHALE PROJECT LOCATIONS: X- 0.0 Y- 0.0 Z- 0.0
DATE DRILL COMPL- 62075 DATE CONV TO MONITOR- 62075 AQUIFER 1: 0.0 - 0.0 FT AQUIFER 2: 0.0 - 0.0 FT

SAMPLES	13	14	15	16	17	18	19
DATE	73176	82976	92476	111476	20177	41977	50977
DEPTH	29.16	29.51	32.04	65.47	29.87	30.62	37.02
TEMP	52.0	48.7	49.0	47.5	46.8	46.4	52.4
LAB ID							
LAB NUM	1506	2146	3544	4333	5904	7963	8444
METHOD	3	3	3	3	3	3	3
AQUIF.LOC.	A	A	A	A	A	A	A
WET							
ALUMINUM	0.0	0.0	0.0	-0.100	0.200	0.0	0.0
AMMONIA	0.0	0.400	0.0	0.0	0.0	0.0	0.0
ARSENIC	0.0	0.0	0.0	-0.010	0.0	0.0	0.0
BICARBONAT	555.000	520.000	575.000	710.000	600.000	590.000	605.000
CADMIUM	0.0	0.0	0.0	0.010	-0.010	0.0	0.0
CALCIUM	90.000	98.000	105.000	52.000	105.000	41.000	51.000
CARBONATE	-0.100	0.0	-0.100	-0.100	-0.100	-0.100	-0.100
CHLORIDE	21.000	9.900	18.000	55.000	12.000	18.000	12.000
CHROMIUM	0.0	0.0	0.0	-0.010	-0.010	0.0	0.0
COPPER	0.0	0.0	0.0	-0.100	-0.100	0.0	0.0
FLUORIDE	0.300	-0.100	0.400	0.100	0.300	0.200	0.200
HYDROXIDE	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRON	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050
LEAD	0.0	0.0	0.0	0.030	0.080	0.0	0.0
MAGNESIUM	115.000	120.000	120.000	140.000	115.000	160.000	140.000
MERCURY	0.0	0.0	0.0	-0.001	0.002	0.0	0.0
NITRATE	3.300	0.200	0.0	0.0	4.300	3.200	4.200
PHOSPHATE	0.100	0.100	0.200	0.100	-0.100	0.400	0.0
POTASSIUM	2.400	5.500	4.000	7.000	2.300	1.700	2.300
SELENIUM	0.0	0.0	0.0	-0.010	-0.010	0.0	0.0
SIL DIOXID	23.000	17.000	26.000	25.000	28.000	21.000	21.000
SODIUM	220.000	150.000	200.000	300.000	190.000	155.000	210.000
SULFATE	685.000	570.000	690.000	650.000	570.000	550.000	600.000
SULFIDE	0.0	0.0	0.0	0.200	1.600	0.0	0.0
ZINC	0.0	0.0	0.0	0.100	0.200	0.0	0.0
GROS ALPHA	0.0	0.0	0.0	4.700	13.000	0.0	0.0
GROSS BETA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HARDNESS	705.000	0.0	765.000	705.000	730.000	750.000	700.000
PH	6.400	6.400	6.100	6.000	0.0	6.300	6.800
CONDUCTANC	1620.000	1820.000	1830.000	1850.000	1900.000	1675.000	1900.000
DIS SOLIDS	1410.000	1390.000	1350.000	1380.000	1390.000	1310.000	1450.000
MANGANESE	-0.050	0.0	-0.050	-0.050	-0.050	-0.050	-0.050
ALKALINITY	455.000	450.000	470.000	580.000	490.000	485.000	495.000
CYANIDE	0.0	0.0	0.0	-0.010	-0.010	0.0	0.0
BORON	0.0	0.200	-0.100	0.400	0.100	0.100	0.100
BARIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SILVER	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NICKEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LITHIUM	0.0	0.0	0.0	-0.100	-0.100	0.0	0.0
DOC	15.000	0.0	14.000	9.000	0.0	6.000	11.000
NITRITE-N	-0.010	0.0	0.100	3.900	0.030	0.040	-0.010
BROMIDE	0.0	0.0	0.0	0.500	-0.100	0.0	0.0

SAMPLES	13	14	15	16	17	18	19
C.O.D.	0.0	0.0	0.0	35.000	5.000	0.0	0.0
PHENOLS	0.0	0.0	0.0	-0.001	-0.001	0.0	0.0
KJELDAHL N	-0.100	1.400	5.400	2.700	2.000	-0.100	0.200
BERYLLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MOLYBDENUM	0.0	0.0	0.0	-0.100	-0.100	0.0	0.0
STRONTIUM	0.0	0.0	0.0	5.500	2.600	0.0	0.0
VANADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ORTHO PHOS	0.100	-0.100	-0.100	0.100	-0.100	-0.100	-0.100
AMMONIA-N	-0.100	0.0	-0.100	0.400	0.100	-0.100	0.200
DIS-ORG C	0.0	0.0	0.0	0.0	9.500	0.0	0.0
MBAS	-0.010	0.0	0.0	0.0	0.0	0.0	0.0
TOT COLIF	90.000	0.0	0.0	0.0	0.0	0.0	0.0
FEC COLIF	-10.000	0.0	0.0	0.0	0.0	0.0	0.0
5-DAY B.O.	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SPECTROGRAPHIC

SAMPLES	13	14	15	16	17	18	19
ALUMINUM	1.000	0.0	0.0	0.100	0.010	0.0	0.0
ANTIMONY	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARSENIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BARIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BERYLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BISMUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BORON	0.500	0.0	0.0	0.500	0.500	0.0	0.0
CADMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CALCIUM	99999.000	0.0	0.0	99999.000	99999.000	0.0	0.0
CERIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CESIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHROMIUM	0.001	0.0	0.0	0.0	0.0	0.0	0.0
COBOLT	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COLUMBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COPPER	0.020	0.0	0.0	0.010	0.001	0.0	0.0
DYSPROSIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EUROPIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GADOLINIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GALLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GERMANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GOLD	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HAFNIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOLMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRIDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRON	0.100	0.0	0.0	0.010	0.001	0.0	0.0
LANTHANUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEAD	0.050	0.0	0.0	0.001	0.010	0.0	0.0
LITHIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LUTETIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAGNESIUM	99999.000	0.0	0.0	99999.000	99999.000	0.0	0.0
MANGANESE	0.010	0.0	0.0	0.010	0.001	0.0	0.0
MERCURY	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MOLYBDENUM	0.010	0.0	0.0	0.050	0.010	0.0	0.0
NEODYMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NICKEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OSMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PALLADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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SAMPLES            13         14         15         16         17         18         19

PLATINUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0
POTASSIUM       0.010      0.0        0.0        0.010      0.0        0.0        0.0
PRASEODYMI      0.0        0.0        0.0        0.0        0.0        0.0        0.0
RADIUM          0.0        0.0        0.0        0.0        0.0        0.0        0.0
RHENIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
RHODIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
RUBIDIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0
RUTHENIUM       0.0        0.0        0.0        0.0        0.0        0.0        0.0
SAMARIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0
SCANDIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0
SELENIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0
SILICON         5.000      0.0        0.0        2.000      0.0        0.0        0.0
SILVER          0.0        0.0        0.0        0.0        0.0        0.0        0.0
SODIUM          5.000      0.0        0.0    99999.000      0.0        0.0        0.0
STRONTIUM       0.100      0.0        0.0        0.100      0.0        0.0        0.0
TANTALUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0
TERBIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
THALLIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0
THORIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
THULIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
TIN             0.0        0.0        0.0        0.0        0.0        0.0        0.0
TITANIUM        0.010      0.0        0.0        0.0        0.0        0.0        0.0
TUNGSTEN        0.0        0.0        0.0        0.0        0.0        0.0        0.0
URANIUM         0.0        0.0        0.0        0.008      0.0        0.0        0.0
VANADIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0
YTTERBIUM       0.0        0.0        0.0        0.0        0.0        0.0        0.0
YTTRIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0
ZINC            0.001      0.0        0.0        0.0        0.0        0.0        0.0
ZIRCONIUM       0.0        0.0        0.0        0.0        0.0        0.0        0.0
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JOB#-741-40 OWNER-RIO BLANCO OIL SHALE PROJECT LOCATIONS: X- 0.0 Y- 0.0 Z- 0.0
DATE DRILL COMPL- 61875 DATE CONV TO MONITOR- 61875 AQUIFER 1: 0.0 - 0.0 FT AQUIFER 2: 0.0 - 0.0 FT

SAMPLES	1	2	3	4	5	6	7	8	9	10	11	12
DATE	63075	71575	80575	83075	101075	112075	121275	12876	21876	41376	52076	62376
DEPTH	5.20	7.99	8.12	5.81	6.25	7.45	6.22	6.43	6.75	7.17	9.08	6.25
TEMP	52.5	51.8	50.0	10.9	46.6	46.8	46.4	44.6	44.2	46.4	45.5	48.0
LAB ID												
LAB NUM	2268	1549	2055	2771	3449	4663	5242	6306	6764	8373	9531	648
METHOD	3	3	3	3	3	3	3	3	3	3	3	3
AQUIF.LOC.	A	A	A	A	A	A	A	A	A	A	A	A
WET												
ALUMINUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.100	0.0	0.0
AMMONIA	0.0	0.400	-0.100	0.200	-0.100	0.100	-0.100	1.100	2.000	0.200	0.500	0.0
ARSENIC	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	0.0
BICARBONAT	580.000	590.000	635.000	540.000	510.000	620.000	600.000	590.000	580.000	470.000	545.000	610.000
CADMIUM	-0.010	-0.010	-0.010	-0.010	-0.010	0.020	-0.010	0.030	0.020	-0.010	0.100	0.0
CALCIUM	31.000	75.000	84.000	48.000	77.000	180.000	120.000	110.000	92.000	110.000	70.000	75.000
CARBONATE	-0.100	-0.100	-0.100	30.000	31.000	-0.100	-0.100	-0.100	-0.100	32.000	36.000	-0.100
CHLORIDE	9.500	25.000	11.000	14.000	21.000	22.000	17.000	16.000	11.000	14.000	30.000	18.000
CHROMIUM	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	0.200	-0.010	0.0
COPPER	-0.100	-0.100	-0.100	0.200	0.400	0.800	1.300	0.200	0.300	-0.100	0.300	0.0
FLUORIDE	0.200	0.300	0.400	0.200	0.800	0.300	0.400	0.200	0.200	0.400	0.200	0.200
HYDROXIDE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRON	2.800	13.300	1.900	8.100	1.500	7.600	8.200	3.800	8.500	0.070	-0.050	-0.050
LEAD	0.040	0.800	0.300	0.500	0.200	0.200	0.200	0.200	0.090	0.010	0.400	0.0
MAGNESIUM	145.000	81.000	110.000	140.000	120.000	40.000	92.000	100.000	80.000	100.000	105.000	110.000
MERCURY	-0.002	-0.002	-0.002	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	0.0
NITRATE	5.200	4.600	5.100	8.500	7.800	4.400	5.000	6.000	8.000	2.000	4.400	8.000
PHOSPHATE	-0.100	-0.100	-0.100	-0.100	-0.100	0.100	-0.100	-0.100	0.100	-0.100	-0.100	0.100
POTASSIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.100	1.000	12.000
SELENIUM	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	0.0
SIL DIOXID	28.000	30.000	29.000	28.000	28.000	28.000	27.000	28.000	27.000	28.000	29.000	27.000
SODIUM	175.000	250.000	185.000	165.000	160.000	230.000	180.000	140.000	195.000	180.000	240.000	180.000
SULFATE	510.000	500.000	485.000	460.000	460.000	460.000	470.000	460.000	450.000	560.000	500.000	450.000
SULFIDE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.100	-0.010	0.0
ZINC	0.100	1.500	0.100	0.200	-0.100	13.000	0.200	0.400	0.200	0.200	0.400	0.0
GROS ALPHA	9.300	4.700	9.100	9.300	11.000	18.000	23.000	16.000	0.0	0.0	0.0	0.0
GROSS BETA	0.0	4.000	0.0	0.0	0.0	0.0	19.000	24.000	0.0	0.0	0.0	0.0
HARDNESS	665.000	520.000	655.000	700.000	700.000	620.000	680.000	700.000	560.000	0.0	610.000	635.000
PH	7.000	7.000	7.000	6.100	6.100	6.300	6.200	6.500	6.300	6.600	6.000	6.500
CONDUCTANC	1910.000	1688.000	1490.000	1590.000	1540.000	1570.000	1600.000	1714.000	1750.000	1770.000	1725.000	1440.000
DIS SOLIDS	1190.000	1260.000	1220.000	1170.000	1160.000	1280.000	1210.000	1120.000	1230.000	1250.000	1270.000	1320.000
MANGANESE	0.100	1.100	0.100	0.800	0.060	0.800	2.100	0.600	1.000	0.200	0.700	-0.050
ALKALINITY	475.000	480.000	520.000	464.000	440.000	505.000	490.000	485.000	475.000	410.000	475.000	500.000
CYANIDE	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	0.020	0.010	-0.010	0.030	-0.010	0.200
BORON	0.600	-0.010	0.600	0.400	0.400	0.100	0.300	0.300	0.200	0.050	8.200	0.0
BARIUM	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000	0.0	0.0	0.0
SILVER	-0.010	-0.010	-0.010	-0.010	0.010	-0.010	-0.010	0.040	0.030	0.0	0.0	0.0
NICKEL	0.010	0.060	0.010	0.060	0.050	0.050	0.100	0.090	0.010	0.0	0.0	0.0
LITHIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.100	0.100	0.0
DOC	19.000	12.000	23.000	11.000	16.000	30.000	28.000	10.000	0.0	3.900	0.0	0.0
NITRITE-N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.020	-0.100	-0.100
BROMIDE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.800	0.0	0.0

SAMPLES	1	2	3	4	5	6	7	8	9	10	11	12
C.O.D.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.000	17.000	0.0
PHENOLS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.001	-0.001	0.0
KJELDAHL N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.400	1.400	-0.100
BERYLLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.300	0.0
MOLYBDENUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STRONTIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VANADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ORTHO PHOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.100	-0.100
AMMONIA-N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.200
DIS-ORG C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.000
MBAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOT COLIF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FEC COLIF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-DAY B.O.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SPECTROGRAPHIC												
ALUMINUM	0.010	0.200	0.100	0.100	0.100	1.000	0.100	1.000	1.000	0.0	0.100	0.0
ANTIMONY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARSENIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BARIUM	0.0	0.0	0.001	0.0	0.0	0.001	0.001	0.010	0.010	0.0	0.0	0.0
BERYLLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BISMUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BORON	0.200	0.200	0.500	0.200	0.200	0.500	0.500	0.020	0.500	0.0	0.500	0.0
CADMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CALCIUM	99999.000	99999.000	10.000	99999.000	99999.000	99999.000	99999.000	99999.000	99999.000	0.0	99999.000	0.0
CERIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CESIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHROMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.001	0.001	0.0	0.0	0.0
COBOLT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COLUMBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COPPER	0.005	0.010	0.010	0.005	0.020	0.020	0.020	0.050	0.050	0.0	0.010	0.0
DYSPROSIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EUROPIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GADOLINIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GALLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GERMANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GOLD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HAFNIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOLMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRIDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRON	0.020	0.050	0.050	0.020	0.050	0.050	0.050	1.000	1.000	0.0	0.010	0.0
LANTHANUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEAD	0.0	0.0	0.0	0.0	0.0	0.001	0.001	0.100	0.020	0.0	0.010	0.0
LITHIUM	0.010	0.010	0.010	0.010	0.001	0.001	0.001	0.0	0.001	0.0	0.0	0.0
LUTETIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAGNESIUM	10.000	99999.000	5.000	99999.000	99999.000	99999.000	99999.000	99999.000	99999.000	0.0	99999.000	0.0
MANGANESE	0.001	0.100	0.010	0.005	0.010	0.100	0.100	0.500	0.100	0.0	0.0	0.0
MERCURY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MOLYBDENUM	0.0	0.001	0.005	0.0	0.0	0.001	0.001	0.001	0.010	0.0	0.010	0.0
NEODYMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NICKEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OSMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PALLADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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08/05/77                     WATER QUALITY ANALYSIS RESULTS -- CORE HOLE ID G-S S-24                    PAGE 213

SAMPLES            1          2          3          4          5          6          7          8          9         10         11         12

PLATINUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
POTASSIUM       1.000      1.000      1.000      1.000      0.100      1.000      1.000      0.010      0.100      0.0        0.010      0.0
PRASEODYMI      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
RADIUM          0.400      0.200      0.200      0.0        0.700      0.0        0.600      0.0        0.0        0.0        0.0        0.0
RHENIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
RHODIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
RUBIDIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
RUTHENIUM       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
SAMARIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
SCANDIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
SELENIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
SILICON         5.000     10.000      5.000      5.000      5.000      2.000      2.000     10.000      5.000      0.0        5.000      0.0
SILVER          0.0        0.001      0.0        0.0        0.0        0.001      0.001      0.010      0.0        0.0        0.0        0.0
SODIUM      99999.000  99999.000  99999.000     10.000      5.000      5.000      5.000      5.000      5.000      0.0        5.000      0.0
STRONTIUM       0.100      0.100      0.010      0.100      0.100      0.100      0.100      0.100      0.100      0.0        0.100      0.0
TANTALUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
TERBIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
THALLIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
THORIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
THULIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
TIN             0.0        0.0        0.0        0.0        0.0        0.001      0.001      0.0        0.0        0.0        0.0        0.0
TITANIUM        0.0        0.001      0.0        0.0        0.001      0.001      0.010      0.050      0.100      0.0        0.001      0.0
TUNGSTEN        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
URANIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
VANADIUM        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.001      0.0        0.0        0.0        0.0
YTTERBIUM       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.001      0.0        0.0        0.0        0.0
YTTRIUM         0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.010      0.0        0.0        0.0        0.0
ZINC            0.0        0.001      0.0        0.0        0.0        0.001      0.0        0.010      0.010      0.0        0.0        0.0
ZIRCONIUM       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
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WATER QUALITY ANALYSIS RESULTS -- CORE HOLE ID G-S S-24

JOB#-741-40 OWNER-RIO BLANCO OIL SHALE PROJECT LOCATIONS: X- 0.0 Y- 0.0 Z- 0.0
DATE DRILL COMPL- 61875 DATE CONV TO MONITOR- 61875 AQUIFER 1: 0.0 - 0.0 FT AQUIFER 2: 0.0 - 0.0 FT

SAMPLES	13	14	15	16	17	18	19
DATE	73176	82976	92476	111576	20177	41977	50977
DEPTH	6.95	6.69	9.67	9.42	6.81	6.78	7.52
TEMP	52.0	50.9	50.0	45.6	45.0	42.8	51.8
LAB ID							
LAB NUM	1507	2147	3545	4128	5905	7964	8445
METHOD	3	3	3	3	3	3	3
AQUIF.LOC.	A	A	A	A	A	A	A
WET							
ALUMINUM	0.0	0.0	0.0	-0.100	-0.100	0.0	0.0
AMMONIA	0.0	0.400	0.0	0.0	0.0	0.0	0.0
ARSENIC	0.0	0.0	0.0	-0.010	0.0	0.0	0.0
BICARBONAT	480.000	555.000	555.000	645.000	605.000	580.000	615.000
CADMIUM	0.0	0.0	0.0	0.020	-0.010	0.0	0.0
CALCIUM	49.000	125.000	96.000	115.000	110.000	42.000	77.000
CARBONATE	-0.100	-0.100	-0.100	-0.100	-0.100	-0.100	-0.100
CHLORIDE	14.000	13.000	18.000	16.000	16.000	18.000	18.000
CHROMIUM	0.0	0.0	0.0	-0.010	-0.010	0.0	0.0
COPPER	0.0	0.0	0.0	-0.100	-0.100	0.0	0.0
FLUORIDE	0.300	0.100	0.400	0.300	0.200	0.200	0.200
HYDROXIDE	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRON	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050
LEAD	0.0	0.0	0.0	0.080	0.040	0.0	0.0
MAGNESIUM	125.000	92.000	105.000	31.000	83.000	130.000	115.000
MERCURY	0.0	0.0	0.0	-0.001	-0.001	0.0	0.0
NITRATE	5.800	6.800	0.0	0.0	12.500	8.200	13.400
PHOSPHATE	-0.100	0.100	-0.100	0.200	-0.100	0.300	0.0
POTASSIUM	3.000	0.0	5.000	5.000	3.000	1.300	2.800
SELENIUM	0.0	0.0	0.0	-0.010	-0.010	0.0	0.0
SIL DIOXID	28.000	17.000	30.000	26.000	25.000	21.000	20.000
SODIUM	180.000	150.000	130.000	310.000	200.000	170.000	180.000
SULFATE	580.000	450.000	455.000	480.000	480.000	450.000	490.000
SULFIDE	0.0	0.0	0.0	0.600	1.600	0.0	0.0
ZINC	0.0	0.0	0.0	0.100	-0.100	0.0	0.0
GROS ALPHA	0.0	0.0	0.0	1.700	4.300	0.0	0.0
GROSS BETA	0.0	0.0	0.0	16.000	0.0	0.0	0.0
HARDNESS	640.000	0.0	675.000	415.000	620.000	645.000	656.000
PH	6.600	6.600	6.400	6.100	0.0	6.400	6.000
CONDUCTANC	1520.000	1680.000	1440.000	1550.000	1750.000	1650.000	1740.000
DIS SOLIDS	1170.000	1260.000	1020.000	1230.000	1280.000	1280.000	1270.000
MANGANESE	-0.050	0.0	-0.050	-0.050	-0.050	-0.050	-0.050
ALKALINITY	395.000	455.000	455.000	530.000	495.000	475.000	505.000
CYANIDE	0.0	0.0	0.0	-0.010	-0.010	0.0	0.0
BORON	0.0	0.200	0.100	0.100	0.900	0.100	0.100
BARIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SILVER	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NICKEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LITHIUM	0.0	0.0	0.0	-0.100	-0.100	0.0	0.0
DOC	14.000	0.0	8.000	16.000	0.0	8.000	12.000
NITRITE-N	-0.010	0.0	1.500	24.500	0.100	0.040	0.200
BROMIDE	0.0	0.0	0.0	-0.100	-0.100	0.0	0.0

WATER QUALITY ANALYSIS RESULTS -- CORE HOLE ID G-S S-24

SAMPLES	13	14	15	16	17	18	19
C.O.D.	0.0	0.0	0.0	47.600	6.900	0.0	0.0
PHENOLS	0.0	0.0	0.0	-0.001	-0.001	0.0	0.0
KJELDAHL N	-0.100	0.700	2.000	2.800	4.100	-0.100	-0.100
BERYLLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MOLYBDENUM	0.0	0.0	0.0	-0.100	-0.100	0.0	0.0
STRONTIUM	0.0	0.0	0.0	4.600	2.900	0.0	0.0
VANADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ORTHO PHOS	-0.100	-0.100	-0.100	-0.100	-0.100	-0.100	-0.100
AMMONIA-N	-0.100	0.0	-0.100	0.500	0.200	-0.100	0.100
DIS-ORG C	0.0	0.0	0.0	0.0	6.500	0.0	0.0
MBAS	-0.010	0.0	0.0	0.0	0.0	0.0	0.0
TOT COLIF	-10.000	0.0	0.0	0.0	0.0	0.0	0.0
FEC COLIF	-10.000	0.0	0.0	0.0	0.0	0.0	0.0
5-DAY B.O.	0.0	0.0	0.0	5.200	0.0	0.0	0.0
SPECTROGRAPHIC							
ALUMINUM	0.010	0.0	0.0	0.010	0.010	0.0	0.0
ANTIMONY	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARSENIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BARIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BERYLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BISMUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BORON	0.200	0.0	0.0	0.200	0.500	0.0	0.0
CADMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CALCIUM	99999.000	0.0	0.0	99999.000	99999.000	0.0	0.0
CERIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CESIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHROMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COBOLT	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COLUMBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COPPER	0.001	0.0	0.0	0.010	0.001	0.0	0.0
DYSPROSIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EUROPIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GADOLINIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GALLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GERMANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GOLD	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HAFNIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOLMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRIDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRON	0.010	0.0	0.0	0.010	0.001	0.0	0.0
LANTHANUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEAD	0.0	0.0	0.0	0.010	0.0	0.0	0.0
LITHIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LUTETIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAGNESIUM	99999.000	0.0	0.0	99999.000	99999.000	0.0	0.0
MANGANESE	0.0	0.0	0.0	0.050	0.0	0.0	0.0
MERCURY	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MOLYBDENUM	0.010	0.0	0.0	0.010	0.010	0.0	0.0
NEODYMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NICKEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OSMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PALLADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WATER QUALITY ANALYSIS RESULTS -- CORE HOLE ID G-S S-24

SAMPLES	13	14	15	16	17	18	19
PLATINUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POTASSIUM	0.010	0.0	0.0	0.010	0.010	0.0	0.0
PRASEODYMI	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RHENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RHODIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RUBIDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RUTHENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SAMARIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SCANDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SELENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SILICON	2.000	0.0	0.0	2.000	0.0	0.0	0.0
SILVER	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SODIUM	5.000	0.0	0.0	99999.000	0.0	0.0	0.0
STRONTIUM	0.100	0.0	0.0	0.100	0.0	0.0	0.0
TANTALUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THALLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THORIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THULIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIN	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TITANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TUNGSTEN	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VANADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YTTERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YTTRIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ZINC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ZIRCONIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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                                   WATER QUALITY ANALYSIS SUMMARY

                                   SAMPLE ITEM RANGE AND AVERAGE

                   COMBINED AQUIFER                                                A AQUIFER
                                               # ITEMS                                                        # ITEMS
ITEM              LOW        HIGH      AVERAGE AVERAGED    STD DEV.          LOW        HIGH      AVERAGE AVERAGED    STD DEV.

WET

ALUMINUM         -0.050      0.100      0.005     21        0.022           -0.100      1.200      0.127     26        0.285
AMMONIA          -0.100      3.000      0.974     28        0.968            0.030      6.400      0.537    107        0.883
ARSENIC          -0.010      0.500      0.038     30        0.099           -0.010     -0.100      0.000    118        0.001
BICARBONAT      350.000  19600.000   2073.000     58     2969.498          360.000    810.000    564.386    163       99.851
CADMIUM          -0.010      0.070      0.009     24        0.016           -0.010      1.100      0.027    126        0.105
CALCIUM           0.100     88.000     26.290     58       21.352           28.000    240.000     96.221    163       34.946
CARBONATE        -0.100   3000.000    163.982     57      402.420           -0.010    120.000      7.006    162       16.843
CHLORIDE          3.000   6600.000    238.352     58      889.457            1.300     71.000     17.682    163        8.725
CHROMIUM         -0.010      0.570      0.057     24        0.132           -0.010      0.200      0.007    125        0.034
COPPER           -0.010      0.100      0.004     24        0.020           -0.010      8.000      0.424    126        1.117
FLUORIDE          0.200     60.000     12.869     58       13.742           -0.100      1.200      0.323    162        0.171
HYDROXIDE        -0.100     -0.100      0.0       30        0.0         **********      0.0        0.0        0        0.0
IRON             -0.050     16.000      0.685     51        2.356           -0.050     28.000      4.486    163        5.744
LEAD             -0.050      0.500      0.065     24        0.107            0.010     13.000      0.310    125        1.166
MAGNESIUM         0.700     96.000     27.265     57       23.215            3.700    160.000     89.755    163       37.385
MERCURY          -0.010     -0.010      0.0       16        0.0             -0.001     -0.010      0.000    126        0.000
NITRATE          -0.100     15.000      1.152     58        2.603           -0.100    165.000      6.387    148       14.465
PHOSPHATE        -0.100      8.200      2.425     24        2.555           -0.010      1.600      0.076    160        0.185
POTASSIUM         0.400     76.000     15.167     30       22.808           -1.000     16.000      4.862     66        3.712
SELENIUM         -0.010     -0.100      0.000     30        0.002           -0.010     -0.100      0.0      126        0.0
SIL DIOXID        6.400     41.000     17.790     58        7.756           16.000     44.000     29.515    163        5.287
SODIUM          165.000  12000.000   1007.276     58     1644.394           66.000    450.000    188.755    163       58.022
SULFATE          -4.000    535.000    180.534     58      129.273          150.000   1000.000    461.902    163      154.311
SULFIDE           0.400     12.000      2.753     19        2.711           -0.010      1.600      0.275     28        0.508
ZINC              0.400      1.000      0.286     14        0.374            0.010     13.000      0.583    124        1.332
GROS ALPHA        0.500     12.000      6.675      8        3.988            0.200     31.000     10.977     99        6.802
GROSS BETA        1.000     57.000     26.229      7       22.851            1.000     35.000     12.644     36        9.542
HARDNESS         30.000    520.000    175.000     57      128.940          280.000    820.000    604.770    148      140.345
PH                6.800      8.800      7.904     57        0.515           -6.000      7.200      6.403    151        0.609
CONDUCTANC      880.000  28000.000   3426.754     57     3980.044          860.000   2275.000   1550.934    161      342.551
DIS SOLIDS      650.000  30700.000   2369.509     57     4277.074          640.000   2090.000   1190.679    162      285.180
MANGANESE        -0.050      0.320      0.018     40        0.064           -0.050     27.000      2.219    154        4.086
ALKALINITY       31.000   9310.000   1069.629     27     1729.022           51.000   1505.000    474.877    162      123.036
CYANIDE      **********      0.0        0.0        0        0.0             -0.010      0.200      0.003    125        0.019
BORON            -0.050      1.500      0.620     10        0.565           -0.010     27.000      0.958    154        2.626
BARIUM       **********      0.0        0.0        0        0.0             -1.000     -1.000      0.0       96        0.0
SILVER       **********      0.0        0.0        0        0.0             -0.010     -0.100      0.007     95        0.013
NICKEL       **********      0.0        0.0        0        0.0              0.010      0.200      0.074     96        0.057
LITHIUM      **********      0.0        0.0        0        0.0             -0.100      0.100      0.007     30        0.025
DOC          **********      0.0        0.0        0        0.0              2.900    292.000     41.650    117       56.977
NITRITE-N    **********      0.0        0.0        0        0.0             -0.010    150.000      4.555     59       20.343
BROMIDE      **********      0.0        0.0        0        0.0             -0.010      0.900      0.273     22        0.349
C.O.D.       **********      0.0        0.0        0        0.0             -1.000     85.000     17.607     30       16.697
PHENOLS      **********      0.0        0.0        0        0.0             -0.001      0.013      0.001     28        0.004
KJELDAHL N   **********      0.0        0.0        0        0.0             -0.100     16.000      2.172     67        2.492
BERYLLIUM    **********      0.0        0.0        0        0.0             -0.020      2.500      0.612      8        0.884
MOLYBDENUM   **********      0.0        0.0        0        0.0             -0.100     -0.100      0.0       16        0.0
STRONTIUM    **********      0.0        0.0        0        0.0              1.400      6.500      3.769     16        1.577
VANADIUM     **********      0.0        0.0        0        0.0         **********      0.0        0.0        0        0.0
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                                              WATER QUALITY ANALYSIS SUMMARY

                                              SAMPLE ITEM RANGE AND AVERAGE

                        COMBINED AQUIFER                                                A AQUIFER
                                                # ITEMS                                                         # ITEMS
ITEM                LOW        HIGH     AVERAGE AVERAGED     STD DEV.              LOW        HIGH     AVERAGE AVERAGED     STD DEV.

ORTHO PHOS    **********       0.0       0.0         0          0.0                -0.100      1.000     0.043      61          0.141
AMMONIA-N     **********       0.0       0.0         0          0.0                -0.100      5.300     0.464      45          0.906
DIS-ORG C     **********       0.0       0.0         0          0.0                 2.000      9.500     4.500      16          2.657
MBAS          **********       0.0       0.0         0          0.0                -0.010     -0.010     0.0         6          0.0
TOT COLIF     **********       0.0       0.0         0          0.0               -10.000    250.000    81.429       7         91.911
FEC COLIF     **********       0.0       0.0         0          0.0               -10.000     40.000     8.571       7         15.736
5-DAY B.O.    **********       0.0       0.0         0          0.0                 3.800      5.200     4.300       3          0.781

SPECTROGRAPHIC

ALUMINUM           0.010     1.000     0.182        50          0.201                0.001      5.000     0.441     127          0.935
ANTIMONY      **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
ARSENIC       **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
BARIUM             0.100     0.100     0.100         1          0.0                  0.001      0.050     0.008      54          0.013
BERYLIUM      **********       0.0       0.0         0          0.0                  0.001      0.001     0.001       5          0.0
BISMUTH            0.100     0.100     0.100         1          0.0             **********      0.0       0.0         0          0.0
BORON              0.050     5.000     0.456        53          0.935                0.010      0.500     0.361     127          0.176
CADMIUM       **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
CALCIUM            2.000 99999.000     5.500         4          3.317               10.000  99999.000    10.000       6          0.0
CERIUM        **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
CESIUM        **********       0.0       0.0         0          0.0                  0.001      0.001     0.001       1          0.0
CHROMIUM           0.001     0.050     0.012        13          0.014                0.000      0.020     0.004      17          0.006
COBOLT        **********       0.0       0.0         0          0.0                  0.001      0.001     0.001       4          0.0
COLUMBIUM     **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
COPPER             0.000     0.050     0.006        30          0.009                0.001      0.050     0.013     126          0.014
DYSPROSIUM    **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
ERBIUM        **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
EUROPIUM      **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
GADOLINIUM    **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
GALLIUM       **********       0.0       0.0         0          0.0                  0.001      0.010     0.004       6          0.005
GERMANIUM     **********       0.0       0.0         0          0.0                  0.001      0.001     0.001       1          0.0
GOLD          **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
HAFNIUM       **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
HOLMIUM       **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
INDIUM        **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
IRIDIUM       **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
IRON               0.010    10.000     0.518        50          1.773                0.001      5.000     0.251     126          0.709
LANTHANUM     **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
LEAD               0.005     0.500     0.129         9          0.212                0.001      0.500     0.030      54          0.076
LITHIUM            0.001     1.000     0.153        36          0.259                0.001      0.100     0.007      86          0.015
LUTETIUM      **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
MAGNESIUM          1.000 99999.000     6.750        12          3.079                5.000  99999.000  2228.111       9       4405.680
MANGANESE          0.010    10.000     0.520        22          2.120                0.001      0.500     0.068     118          0.121
MERCURY       **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
MOLYBDENUM         0.001     0.061     0.012        28          0.017                0.001      0.050     0.009      87          0.013
NEODYMIUM     **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
NICKEL        **********       0.0       0.0         0          0.0                  0.001      0.070     0.011       7          0.026
OSMIUM        **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
PALLADIUM     **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
PLATINUM      **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
POTASSIUM          0.100 99999.000     1.538        42          2.383                0.010      2.000     0.519     126          0.507
PRASEODYMI    **********       0.0       0.0         0          0.0             **********      0.0       0.0         0          0.0
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                                   WATER QUALITY ANALYSIS SUMMARY

                                   SAMPLE ITEM RANGE AND AVERAGE

                  COMBINED AQUIFER                                                   A AQUIFER
                                            # ITEMS                                                        # ITEMS
ITEM              LOW       HIGH    AVERAGE AVERAGED   STD DEV.             LOW       HIGH    AVERAGE AVERAGED   STD DEV.

RADIUM           0.300     0.500     0.400     3       0.100               0.100     1.200     0.335    60       0.231
RHENIUM     **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
RHODIUM     **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
RUBIDIUM    **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
RUTHENIUM   **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
SAMARIUM    **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
SCANDIUM    **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
SELENIUM    **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
SILICON          5.000 99999.000    16.245    53       8.190               2.000 99999.000     4.897   117       2.601
SILVER           0.000     0.000     0.000     3       0.000               0.000     0.100     0.008    38       0.022
SODIUM       99999.000 99999.000     0.0       0       0.0                 1.000 99999.000     6.239    88       2.758
STRONTIUM        0.100     0.500     0.185    34       0.144               0.010     1.000     0.105   116       0.085
TANTALUM    **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
TERBIUM     **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
THALLIUM    **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
THORIUM     **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
THULIUM     **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
TIN         **********     0.0       0.0       0       0.0                 0.001     0.001     0.001    15       0.0
TITANIUM         0.001     0.200     0.020    38       0.036               0.001     1.000     0.029    91       0.118
TUNGSTEN    **********     0.0       0.0       0       0.0            **********     0.0       0.0       0       0.0
URANIUM     **********     0.0       0.0       0       0.0                 0.005     0.008     0.006     2       0.002
VANADIUM         0.001     0.050     0.019    19       0.020               0.001     0.020     0.007    10       0.008
YTTERBIUM   **********     0.0       0.0       0       0.0                 0.001     0.001     0.001     5       0.0
YTTRIUM     **********     0.0       0.0       0       0.0                 0.010     0.020     0.012     5       0.004
ZINC             0.005     0.100     0.041     4       0.044               0.001     0.020     0.005    44       0.006
ZIRCONIUM   **********     0.0       0.0       0       0.0                 0.010     0.010     0.010     2       0.0

            SAMPLES IN AQUIFER =    58                           SAMPLES IN AQUIFER =  163
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UPPER AND LOWER AQUIFER MONITORING

SECTION 1.2.7

WET CHEMICAL AND SPECTROGRAPHIC ANALYSES, UPPER AND LOWER AQUIFER

WATER LEVEL DATA, UPPER AND LOWER AQUIFERS

EXPLANATION -- WATER QUALITY COMPUTER OUTPUT SHEETS

1. Code Hole Description Data

Job # 741-40

Assigned project number for Rio Blanco Oil Shale Project by Wright Water Engineers, Inc

X = Distance in feet, north of baseline 7200 feet Datum of the Colorado State Coordinate System

Y = Distance, in feet, east of the baseline 7200 foot Datum of the Colorado State Coordinate System

Z = Elevation in feet above sea of the core hole at ground surface

Date Drill Compl.

The date when drilling was completed on the Core Hole.

Conv. to Monitor

Date the Core Hole was converted to a Monitor Hole.

Aquifer 1:

Depth in feet to the top and bottom of the upper aquifer from G.L.

Aquifer 2:

Depth in feet to the top and bottom of the lower aquifer from G.C.

2. Sample Description Data

Date

Date water sample was collected.

Depth

Depth for Method 1: depth sample was collected during drilling.
Depth for Method 2: depth sample was collected during pumping test.
Depth for Method 3: the static water level of the hole when sampled.

Temp.

Field temperature of sample (^{o}F)

Lab Num.

Designation number assigned by the analyzing laboratory.

Method

0. Drilling soap sample
1. Drilling program sample
2. Pumping test program sample
3. Monitoring program sample

3A. Monitoring program sample, not representative of aquifer conditions

Aquif. Loc.

U Sample from upper aquifer during drilling, pumping or monitoring

L Sample from lower aquifer during pumping test or monitoring

C Sample combination of upper and lower aquifer during drilling

A Sample from alluvial aquifer

3. Wet -- Wet Chemical Analysis

Values are in milligrams per liter, except for:

Gross Alpha-- picocuries per liter

Gross Beta -- picocuries per liter

pH -- standard pH values

Conductance-- micromhos per centimeter

Negative values indicate less than minimum detectable limit indicated

0.0 value - constituent not tested for

**** - not analyzed for using wet chemical analysis

4. Spectrographic - spectrographic analysis of 67 elements

All values are in milligrams per liter

0.0 means less than minimum detectable amount

99999.000 means major amount

***** is used in Water Quality Analysis Summary to indicate an element has not been analyzed above the minimum detectable limit

WATER QUALITY ANALYSIS RESULTS -- CORE HOLE ID G-S M-5

JOB#-741-40 OWNER-RIO BLANCO OIL SHALE PROJECT LOCATIONS: X- 0.0 Y- 0.0 Z- 0.0 MONITOR AQUIFER
DATE DRILL CCMPL- 63075 DATE CONV TO MONITOR- 70175 AQUIFER 1: 250.00- 280.00FT AQUIFER 2: 0.0 - 0.0 FT

SAMPLES	1	2	3	4	5	6	7	8	9
DATE	62775	71675	82975	121275	12876	21876	32576	111376	41977
DEPTH	285.00	236.39	236.13	235.24	235.70	235.64	235.51	235.84	236.21
TEMP	58.7	53.6	56.3	53.5	50.0	50.0	49.8	57.2	52.6
LAB ID									
LAB NUM	2304	1351	2759	5234	6298	6765	7942	4332	7960
METHOD	1	3	3	3	3	3	3	3	3
AQUIF.LOC.	M	M	M	M	M	M	M	X	X
WET									
ALUMINUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.100	0.200
AMMONIA	0.0	0.600	0.800	0.200	0.400	1.100	0.200	0.0	0.0
ARSENIC	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010
BICARBONAT	460.000	450.000	465.000	420.000	430.000	460.000	400.000	425.000	305.000
CADMIUM	-0.010	-0.010	-0.010	-0.010	0.020	0.010	-0.010	0.020	-0.010
CALCIUM	29.000	28.000	24.000	34.000	41.000	28.000	42.000	33.000	18.000
CARBONATE	18.000	10.000	-0.100	-0.100	-0.100	-0.100	36.000	24.000	60.000
CHLORIDE	38.000	23.000	11.000	21.000	23.000	19.000	17.000	41.000	18.000
CHROMIUM	-0.010	-0.010	-0.010	-0.010	-0.010	-0.100	0.010	-0.010	-0.010
COPPER	-0.100	-0.100	-0.100	0.700	1.700	0.300	0.200	-0.100	-0.100
FLUORIDE	0.400	0.300	0.500	0.300	0.200	0.200	0.200	0.300	0.200
HYDROXIDE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRON	7.100	16.900	8.300	9.000	14.000	16.000	0.100	2.300	-0.050
LEAD	0.080	0.300	0.700	0.200	0.500	0.200	0.300	-0.010	-0.010
MAGNESIUM	23.000	62.000	67.000	50.000	42.000	63.000	44.000	34.000	28.000
MERCURY	-0.002	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
NITRATE	0.200	0.300	5.500	0.300	0.300	1.300	0.100	0.0	0.200
PHOSPHATE	-0.100	-0.100	-0.100	-0.100	-0.100	-0.100	-0.100	-0.100	-0.100
POTASSIUM	0.0	0.0	0.0	0.0	0.0	0.0	1.800	8.500	2.500
SELENIUM	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010
SIL DIOXID	22.000	9.200	10.000	7.400	9.000	13.000	9.400	8.100	2.500
SODIUM	690.000	780.000	870.000	850.000	780.000	700.000	770.000	740.000	610.000
SULFATE	1100.000	1520.000	1740.000	1720.000	1520.000	1350.000	1400.000	1300.000	1100.000
SULFIDE	0.0	0.0	0.0	0.0	0.0	0.0	1.900	0.200	-1.000
ZINC	-0.100	1.100	1.200	0.500	1.200	0.400	0.900	-0.100	-0.100
GROS ALPHA	14.000	3.900	17.000	16.000	31.000	0.0	0.0	0.0	8.700
GROSS BETA	0.0	44.000	43.000	74.000	16.000	0.0	0.0	0.0	0.0
HARDNESS	170.000	325.000	335.000	290.000	280.000	330.000	0.0	220.000	160.000
PH	7.000	6.900	6.600	6.800	7.000	6.600	6.800	7.800	7.200
CONDUCTANC	3420.000	3300.000	3430.000	3400.000	3370.000	4000.000	3200.000	3000.000	2550.000
DIS SOLIDS	2150.000	2670.000	2960.000	2880.000	2620.000	2560.000	2610.000	2580.000	2170.000
MANGANESE	0.080	0.900	0.600	0.300	4.800	0.600	0.900	0.060	0.100
ALKALINITY	390.000	370.000	380.000	340.000	350.000	375.000	355.000	365.000	300.000
CYANIDE	-0.010	-0.010	-0.010	0.020	-0.010	-0.010	-0.010	-0.010	-0.010
BORON	0.700	0.200	0.800	0.300	0.200	1.200	0.300	0.400	0.100
BARIUM	-1.000	-1.000	-1.000	0.300	-1.000	-1.000	0.0	0.0	0.200
SILVER	-0.010	-0.010	-0.010	-0.010	0.020	-0.010	0.0	0.0	0.0
NICKEL	0.200	0.060	0.070	0.030	0.100	0.030	0.0	0.0	0.0
LITHIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.100	0.200	0.0
DOC	1350.000	8.000	6.000	3.000	5.000	0.0	5.300	6.000	6.000
NITRITE-N	0.0	0.0	0.0	0.0	0.0	0.0	-0.020	-0.100	-0.010
BROMIDE	0.0	0.0	0.0	0.0	0.0	0.0	0.200	-0.100	0.300

WATER QUALITY ANALYSIS RESULTS -- CORE HOLE ID G-S M-5

SAMPLES	1	2	3	4	5	6	7	8	9
C.O.D.	0.0	0.0	0.0	0.0	0.0	0.0	26.000	35.000	14.000
PHENOLS	0.0	0.0	0.0	0.0	0.0	0.0	-0.001	-0.001	0.004
KJELDAHL N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BERYLLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.010
MOLYBDENUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.100	-0.100
STRONTIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.700	-0.100
VANADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.100
ORTHO PHOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AMMONIA-N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.400	0.200
DIS-ORG C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MBAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOT COLIF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FEC COLIF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-DAY B.O.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SPECTROGRAPHIC									
ALUMINUM	0.0	0.050	0.005	0.500	2.000	0.100	0.010	0.0	0.010
ANTIMONY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARSENIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BARIUM	0.0	0.001	0.0	0.0	0.010	0.0	0.0	0.0	0.0
BERYLLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BISMUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BORON	0.0	0.200	0.500	0.500	0.010	0.200	0.200	0.0	0.050
CADMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CALCIUM	0.0	99999.000	99999.000	99999.000	99999.000	10.000	99999.000	0.0	99999.000
CERIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CESIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHROMIUM	0.0	0.0	0.0	0.0	0.001	0.0	0.0	0.0	0.0
COBOLT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COLUMBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COPPER	0.0	0.001	0.005	0.020	0.050	0.050	0.010	0.0	0.001
DYSPROSIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EUROPIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GADOLINIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GALLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GERMANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GOLD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HAFNIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOLMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRIDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IRON	0.0	0.050	0.050	0.100	2.000	0.500	0.010	0.0	0.010
LANTHANUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEAD	0.0	0.0	0.0	0.001	0.100	0.020	0.0	0.0	0.0
LITHIUM	0.0	0.001	0.001	0.001	0.0	0.010	0.0	0.0	0.0
LUTETIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAGNESIUM	0.0	99999.000	99999.000	99999.000	99999.000	5.000	99999.000	0.0	5.000
MANGANESE	0.0	0.005	0.001	0.050	0.500	0.010	0.010	0.0	0.010
MERCURY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MOLYBDENUM	0.0	0.0	0.0	0.0	0.0	0.0	0.010	0.0	0.0
NEODYMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NICKEL	0.0	0.0	0.0	0.0	0.001	0.0	0.0	0.0	0.0
OSMIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PALLADIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SAMPLES	1	2	3	4	5	6	7	8	9
PLATINUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
POTASSIUM	0.0	1.000	0.100	1.000	0.010	0.100	0.010	0.0	0.100
PRASEODYMI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RADIUM	0.0	0.300	0.0	0.200	0.0	0.0	0.0	0.0	0.0
RHENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RHODIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RUBIDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RUTHENIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SAMARIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SCANDIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SELENIUM	0.0	0.100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SILICON	0.0	2.000	5.000	5.000	10.000	2.000	5.000	0.0	10.000
SILVER	0.0	0.0	0.0	0.001	0.0	0.0	0.0	0.0	0.0
SODIUM	0.0	10.000	5.000	5.000	2.000	99999.000	10.000	0.0	99999.000
STRONTIUM	0.0	0.100	0.100	0.100	0.100	0.100	0.100	0.0	0.010
TANTALUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TERBIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THALLIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THORIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THULIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TITANIUM	0.0	0.001	0.001	0.001	0.050	0.001	0.0	0.0	0.0
TUNGSTEN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VANADIUM	0.0	0.0	0.0	0.0	0.010	0.0	0.0	0.0	0.0
YTTERBIUM	0.0	0.0	0.0	0.0	0.001	0.0	0.0	0.0	0.0
YTTRIUM	0.0	0.0	0.0	0.0	0.010	0.0	0.0	0.0	0.0
ZINC	0.0	0.0	0.0	0.0	0.020	0.005	0.0	0.0	0.0
ZIRCONIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WATER QUALITY ANALYSIS SUMMARY

SAMPLE ITEM RANGE AND AVERAGE

	LOWER AQUIFER					UPPER AQUIFER				
ITEM	LOW	HIGH	AVERAGE	# ITEMS AVERAGED	STD DEV.	LOW	HIGH	AVERAGE	# ITEMS AVERAGED	STD DEV.
WET										
ALUMINUM	-0.010	1.600	0.198	69	0.308	-0.010	1.000	0.135	69	0.213
AMMONIA	-0.010	9.600	0.654	173	0.944	-0.100	10.600	0.622	188	1.044
ARSENIC	-0.010	0.050	0.001	214	0.005	-0.010	0.200	0.003	220	0.017
BICARBONAT	-0.100	11800.000	1085.043	229	1181.998	-0.100	2760.000	607.313	249	491.761
CADMIUM	-0.001	0.030	0.002	215	0.006	-0.001	0.100	0.002	205	0.009
CALCIUM	0.800	515.000	33.261	229	66.831	0.800	780.000	63.333	249	67.951
CARBONATE	-0.010	3160.000	91.750	229	237.864	-0.010	1190.000	33.144	248	89.991
CHLORIDE	-0.100	205.000	34.662	229	38.559	-0.100	240.000	23.851	249	30.561
CHROMIUM	-0.010	-0.050	0.002	210	0.007	-0.010	0.500	0.007	206	0.039
COPPER	-0.010	0.300	0.015	215	0.044	-0.010	0.800	0.021	205	0.091
FLUORIDE	0.030	120.000	14.510	230	19.371	0.060	80.000	3.683	249	9.750
HYDROXIDE	-0.100	890.000	221.250	8	409.684	-0.100	380.000	9.500	40	60.083
IRON	-0.050	33.000	2.572	229	4.266	-0.005	36.000	3.690	233	5.003
LEAD	0.002	26.000	0.555	215	2.276	0.002	3.800	0.305	205	0.509
MAGNESIUM	-1.000	140.000	34.736	229	30.292	-0.100	200.000	54.719	248	34.283
MERCURY	-0.001	-0.010	0.000	211	0.000	-0.001	0.045	0.000	209	0.003
NITRATE	-0.010	55.000	0.694	208	3.951	-0.010	7.000	0.548	227	1.013
PHOSPHATE	-0.010	2.400	0.047	216	0.199	-0.010	9.200	0.143	208	0.845
POTASSIUM	-1.000	84.000	6.553	49	12.814	-0.100	93.000	7.691	85	17.556
SELENIUM	-0.001	-0.100	0.0	215	0.0	-0.001	-0.100	0.000	222	0.001
SIL DIOXID	-0.100	60.000	11.275	229	9.600	-0.100	58.000	25.145	249	14.347
SODIUM	86.000	5290.000	525.201	229	529.847	40.000	1170.000	269.582	249	210.228
SULFATE	3.500	740.000	198.116	229	172.492	-4.000	900.000	337.759	249	175.126
SULFIDE	-0.010	6.500	1.064	47	1.207	0.030	49.000	2.810	64	8.278
ZINC	-0.001	68.000	1.107	215	5.725	-0.010	15.000	0.607	197	1.397
GROS ALPHA	0.100	86.000	5.915	149	9.473	0.100	29.000	4.667	132	4.756
GROSS BETA	2.000	830.000	50.357	56	116.733	2.000	73.000	19.857	35	17.609
HARDNESS	20.000	1260.000	230.213	207	208.031	16.000	1870.000	377.920	226	235.659
PH	6.000	12.200	7.334	227	0.786	6.000	10.200	7.019	246	0.648
CONDUCTANC	760.000	15800.000	2192.969	227	1824.420	675.000	6200.000	1534.698	248	768.250
DIS SOLIDS	430.000	12200.000	1508.180	228	1197.430	425.000	3140.000	1131.855	249	505.665
MANGANESE	-0.010	0.800	0.063	223	0.103	-0.010	1.700	0.146	221	0.199
ALKALINITY	-0.100	10480.000	922.904	224	1043.326	-0.100	2390.000	515.342	208	454.729
CYANIDE	-0.010	0.800	0.005	209	0.056	-0.010	0.100	0.002	181	0.011
BORON	-0.010	25.000	1.659	212	3.051	-0.010	4.800	0.642	192	0.941
BARIUM	-0.100	1.000	0.006	168	0.077	-0.100	1.000	0.007	140	0.085
SILVER	-0.001	0.110	0.003	166	0.015	-0.001	1.000	0.014	138	0.087
NICKEL	-0.001	0.100	0.023	166	0.019	-0.001	0.200	0.027	139	0.028
LITHIUM	-0.100	1.000	0.109	44	0.197	-0.100	1.000	0.117	47	0.275
DOC	1.000	73.000	11.134	166	8.180	-1.000	50.000	10.129	157	6.929
NITRITE-N	-0.020	0.600	0.149	43	0.198	-0.020	0.600	0.157	44	0.192
BROMIDE	-0.020	0.400	0.018	38	0.068	-0.020	0.500	0.062	43	0.121
C.O.D.	-0.100	92.000	22.941	44	18.900	-0.100	400.000	48.233	45	75.591
PHENOLS	-0.001	1.000	0.034	44	0.152	-0.001	0.174	0.010	45	0.029
KJELDAHL N	**********	0.0	0.0	0	0.0	**********	0.0	0.0	0	0.0
BERYLLIUM	-0.010	-0.100	0.0	2	0.0	-0.010	-0.010	0.0	2	0.0
MOLYBDENUM	-0.050	0.200	0.017	24	0.048	-0.050	1.800	0.142	24	0.419
STRONTIUM	0.200	5.000	1.312	24	1.288	0.100	11.700	4.612	24	3.037
VANADIUM	-0.050	-0.050	0.0	2	0.0	-0.050	-0.050	0.0	2	0.0

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                                    WATER QUALITY ANALYSIS SUMMARY

                                    SAMPLE ITEM RANGE AND AVERAGE

                LOWER AQUIFER                                        UPPER AQUIFER
                                      # ITEMS                                                      # ITEMS
ITEM              LOW       HIGH   AVERAGE AVERAGED   STD DEV.          LOW       HIGH   AVERAGE AVERAGED   STD DEV.

ORTHO PHOS    **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
AMMONIA-N          0.400  12.000     1.955    20        2.485            0.200     1.800   0.600    22        0.416
DIS-ORG C     **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
MBAS          **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
TOT COLIF     **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
FEC COLIF     **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
5-DAY B.O.    **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0

SPECTROGRAPHIC

ALUMINUM           0.001     5.000   0.125   196        0.390            0.001     1.000   0.136   219        0.195
ANTIMONY           0.200     0.200   0.200     1        0.0         **********     0.0     0.0       0        0.0
ARSENIC       **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
BARIUM             0.001     0.100   0.016    28        0.032            0.001     0.050   0.006    26        0.010
BERYLIUM      **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
BISMUTH       **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
BORON              0.050 99999.000   0.437   195        0.622           -0.020     5.000   0.353   219        0.409
CADMIUM        99999.000 99999.000   0.0       0        0.0          99999.000 99999.000   0.0       0        0.0
CALCIUM            0.100 99999.000   6.836    36        4.341            1.000 99999.000   7.158    19        3.976
CERIUM        **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
CESIUM        **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
CHROMIUM           0.001     0.010   0.005     2        0.006            0.000     0.050   0.010    13        0.013
COBOLT        **********     0.0     0.0       0        0.0              0.001     0.001   0.001     1        0.0
COLUMBIUM     **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
COPPER             0.001     0.100   0.007   172        0.010            0.000     0.050   0.008   181        0.010
DYSPROSIUM    **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
ERBIUM        **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
EUROPIUM      **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
GADOLINIUM    **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
GALLIUM       **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
GERMANIUM     **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
GOLD          **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
HAFNIUM       **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
HOLMIUM       **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
INDIUM        **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
IRIDIUM       **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
IRON               0.005     5.000   0.112   196        0.510            0.010     2.000   0.113   216        0.221
LANTHANUM     **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
LEAD               0.000     0.500   0.029    39        0.084            0.001     0.500   0.034    52        0.080
LITHIUM            0.001     5.000   0.049   144        0.416            0.001     0.500   0.026   143        0.058
LUTETIUM           0.010     0.010   0.010     1        0.0              0.001     0.010   0.005     2        0.006
MAGNESIUM          0.100 99999.000   3.967    36        3.098            0.100 99999.000   6.277    22        4.054
MANGANESE          0.001     0.200   0.016   156        0.031            0.001     1.000   0.028   163        0.084
MERCURY       **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
MOLYBDENUM         0.001     0.100   0.008    97        0.015            0.001     0.500   0.015   113        0.066
NEODYMIUM          0.090     0.090   0.090     1        0.0         **********     0.0     0.0       0        0.0
NICKEL             0.001     0.001   0.001     1        0.0              0.001     0.010   0.005     5        0.005
OSMIUM        **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
PALLADIUM     **********     0.0     0.0       0        0.0              0.100     0.100   0.100     1        0.0
PLATINUM      **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
POTASSIUM          0.010 99999.000   1.207   187        1.496            0.010 99999.000   1.009   200        1.445
PRASEODYMI    **********     0.0     0.0       0        0.0         **********     0.0     0.0       0        0.0
```

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                                        WATER QUALITY ANALYSIS SUMMARY

                                        SAMPLE ITEM RANGE AND AVERAGE

                   LOWER AQUIFER                                                        UPPER AQUIFER
                                              # ITEMS                                                               # ITEMS
ITEM                LOW        HIGH     AVERAGE AVERAGED    STD DEV.                LOW        HIGH     AVERAGE AVERAGED    STD DEV.

RADIUM             0.090       2.100     0.416     43        0.386                0.100       0.800     0.194     31        0.150
RHENIUM       **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
RHODIUM       **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
RUBIDIUM      **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
RUTHENIUM     **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
SAMARIUM      **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
SCANDIUM      **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
SELENIUM      **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
SILICON           -0.500   99999.000     5.533    195        3.841                1.000      50.000     9.132    219        8.402
SILVER             0.000       0.001     0.001     14        0.000                0.000       0.001     0.000     19        0.000
SODIUM             0.100   99999.000     7.490     92        2.716                2.000   99999.000     7.340    106        2.888
STRONTIUM          0.001   99999.000     0.113    178        0.124                0.001       1.000     0.132    184        0.121
TANTALUM      **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
TERBIUM       **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
THALLIUM      **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
THORIUM       **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
THULIUM       **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
TIN                0.000       0.001     0.001      2        0.001                0.001       0.001     0.001      1        0.0
TITANIUM           0.001       0.050     0.004     80        0.006                0.001       0.150     0.010    117        0.023
TUNGSTEN      **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
URANIUM           -1.500      -1.500     0.0        1        0.0             **********       0.0       0.0        0        0.0
VANADIUM      **********       0.0       0.0        0        0.0                  0.001       0.100     0.027     16        0.027
YTTERBIUM     **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
YTTRIUM       **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0
ZINC               0.001       0.500     0.032     42        0.110                0.001       0.500     0.026     51        0.077
ZIRCONIUM     **********       0.0       0.0        0        0.0             **********       0.0       0.0        0        0.0

              SAMPLES IN AQUIFER =  230                                  SAMPLES IN AQUIFER =  249
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APPENDIX B

RIO BLANCO OIL SHALE PROJECT
PROGRESS REPORT 11

MARCH, APRIL, MAY, 1977

HYDROLOGIC PROGRAM
SECTION 1.2

RAW DATA
FOR
FINAL ENVIRONMENTAL REPORT
FOR
84 MESA

GULF OIL CORPORATION
and
STANDARD OIL COMPANY (INDIANA)

TABLE OF CONTENTS

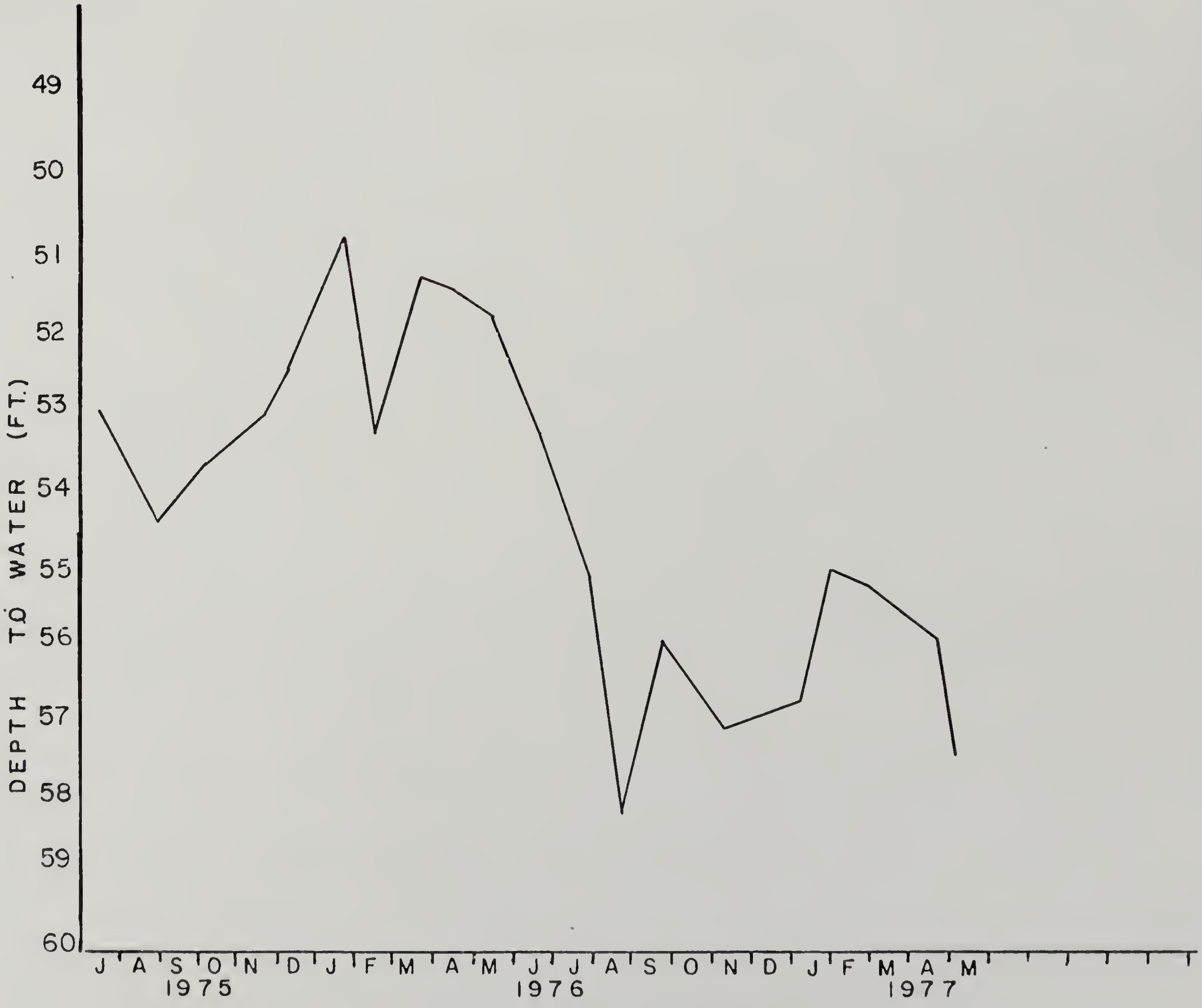
Section No.

Alluvial Aquifer Monitoring Program 1.2.8.2

- Alluvial Aquifer Hydrographs
- Alluvial Aquifer, Temperature and pH vs. Time
- Alluvial Aquifer, Trilinear Diagrams

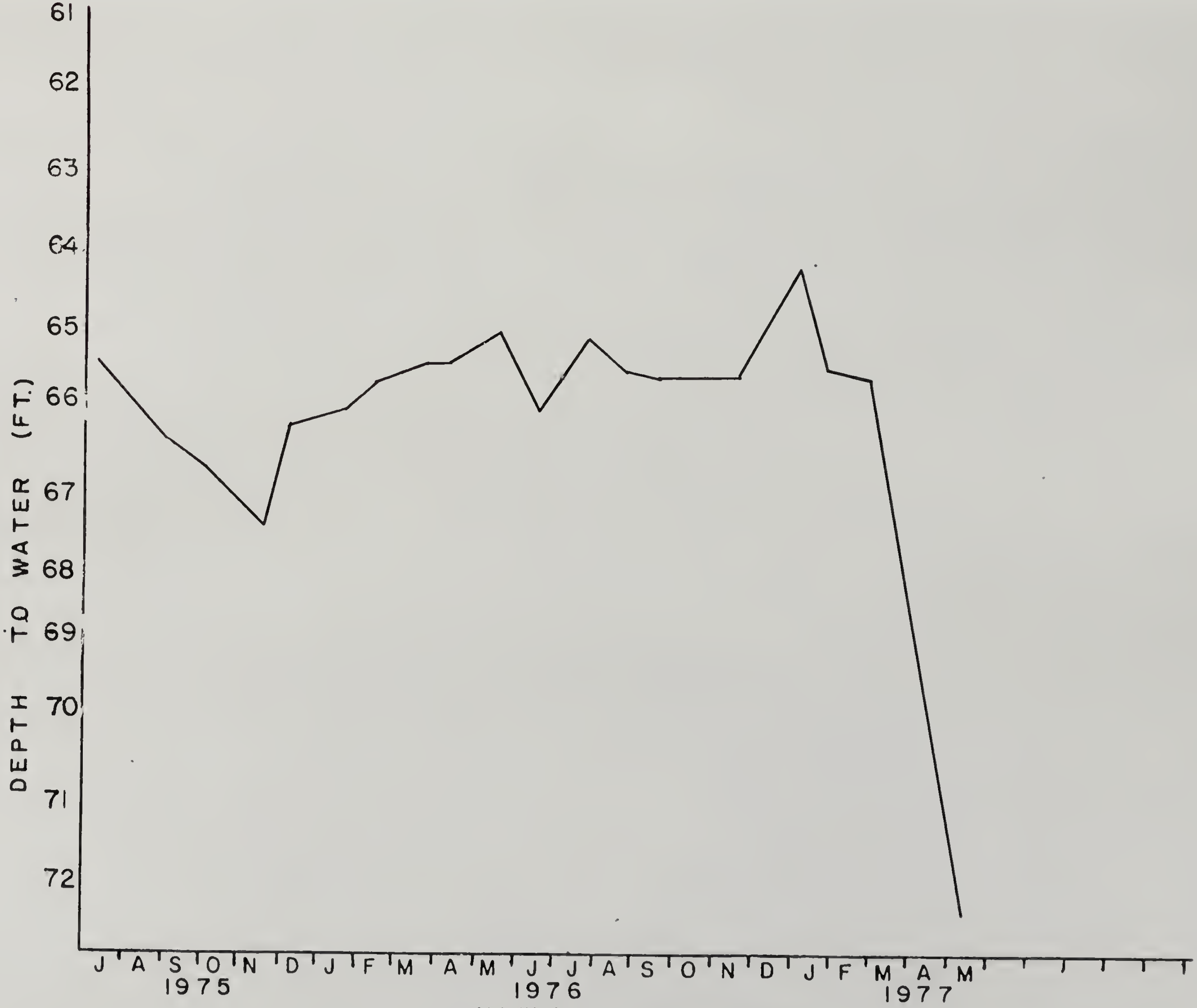
SECTION 1.2.8.2.

ALLUVIAL AQUIFERS



ALLUVIAL AQUIFER HYDROGRAPH

G-S S-19



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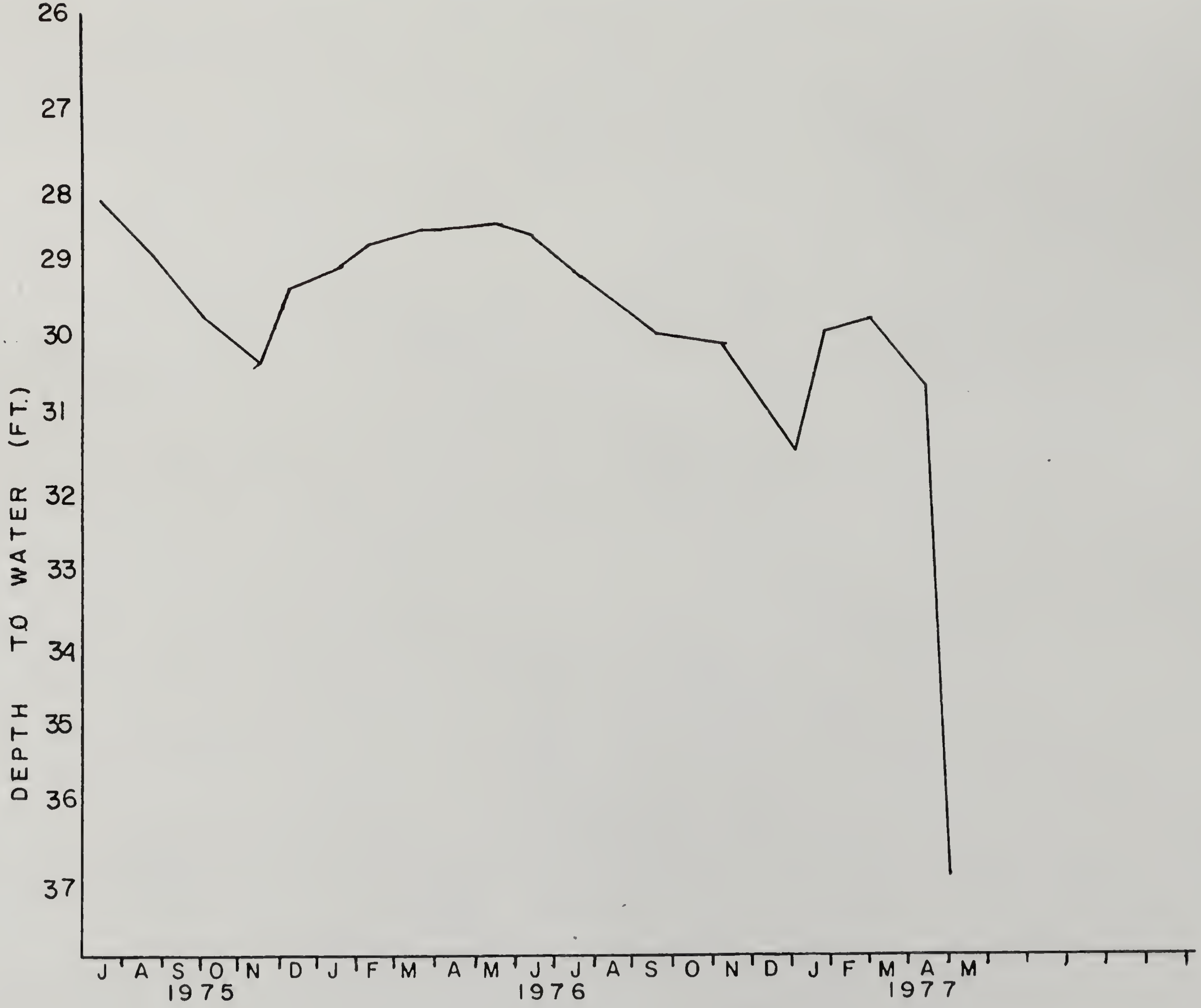

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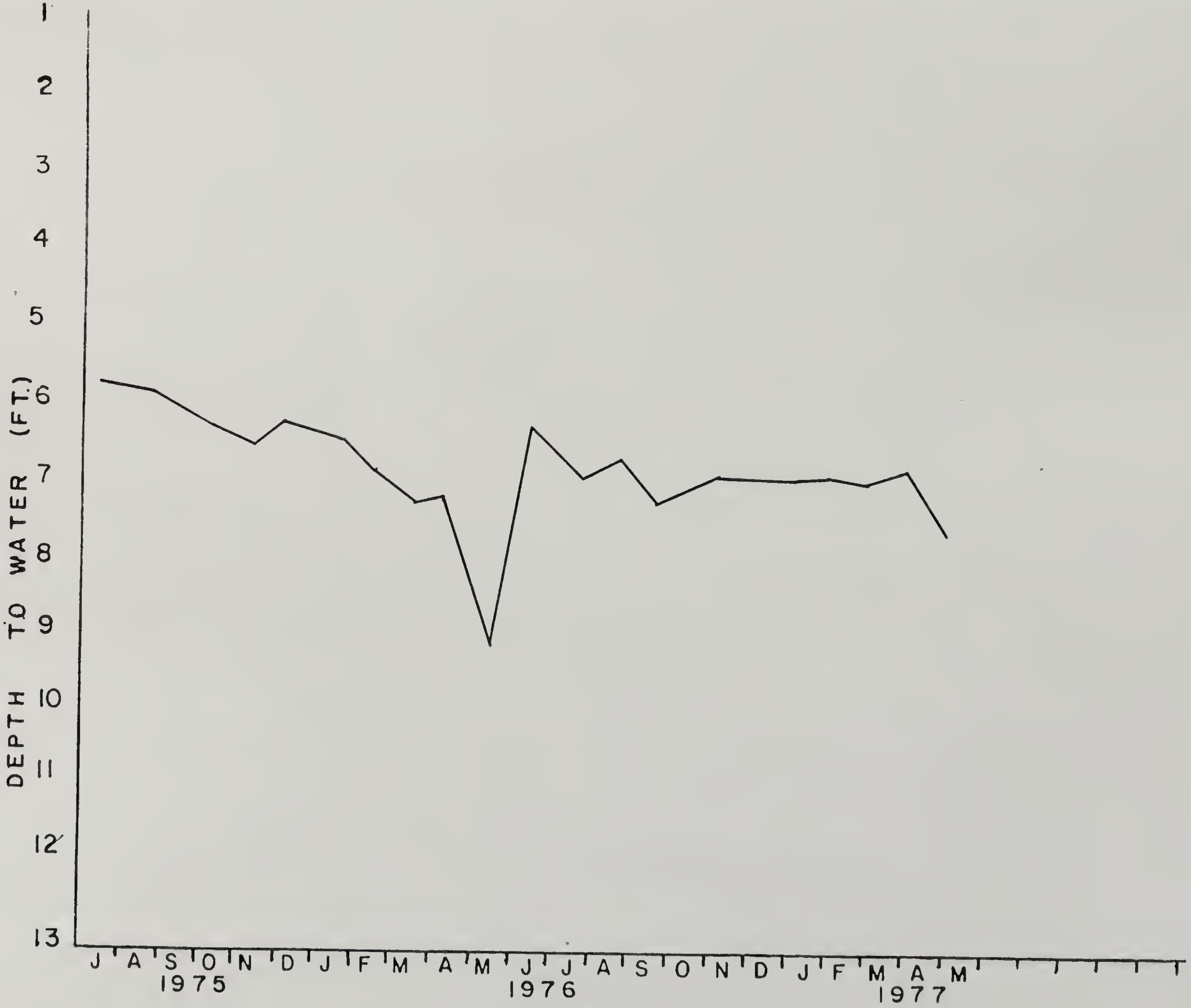

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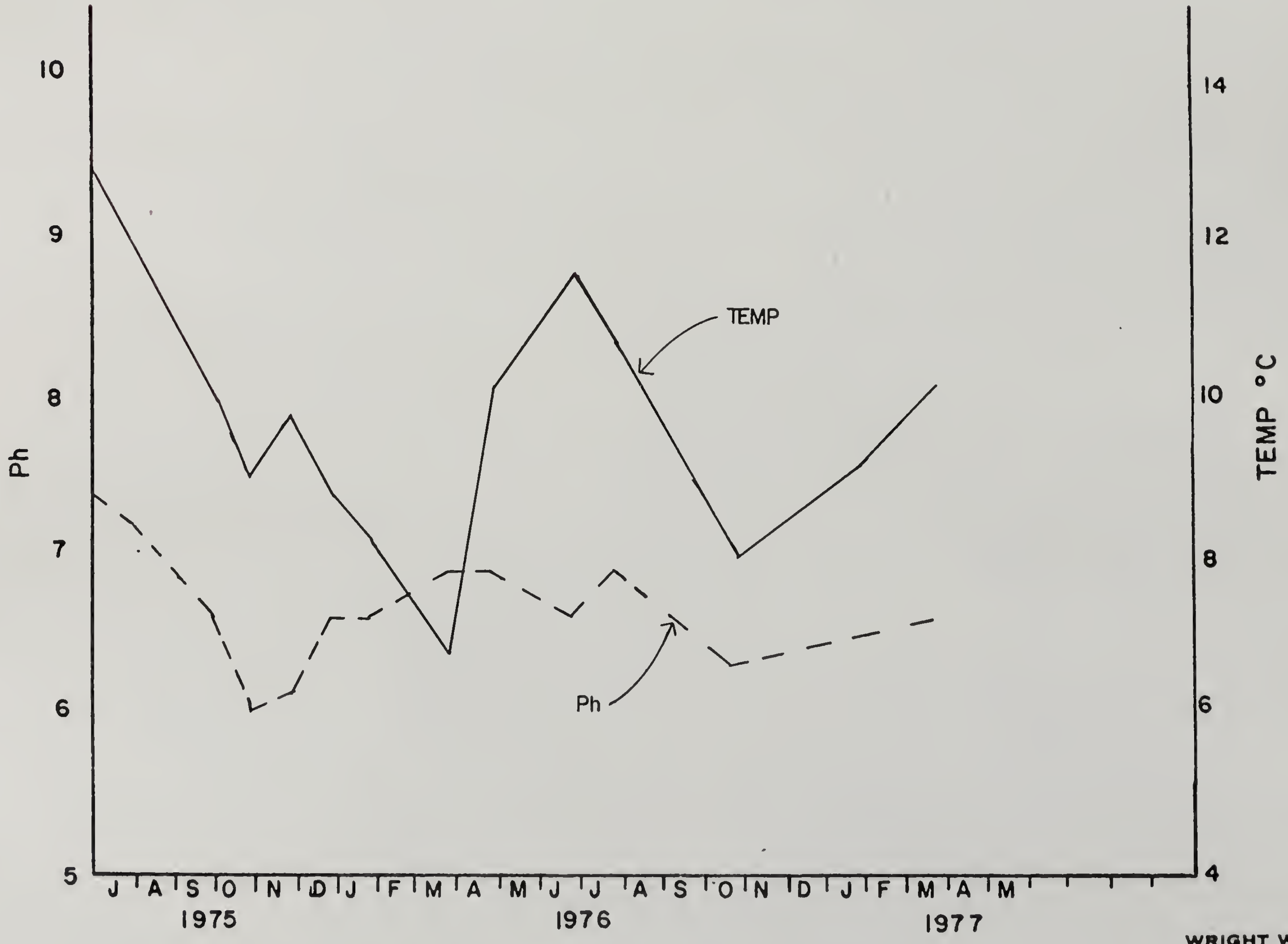
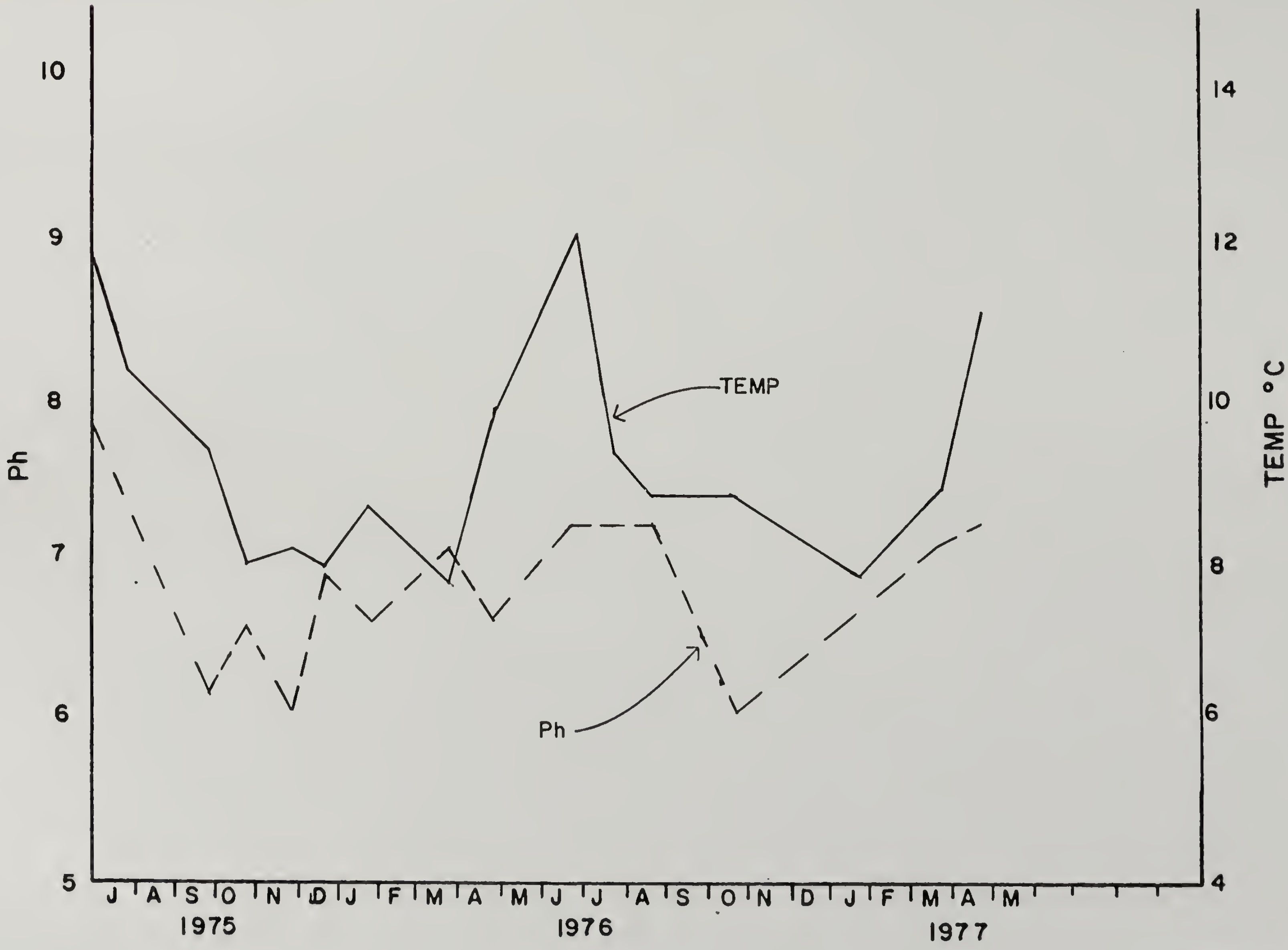


ALLUVIAL AQUIFER, TEMPERATURE AND pH VS. TIME, G-5 S-19

WRIGHT WATER ENGINEERS, INC.
ENGINEERING CONSULTANTS
2420 ALCOTT STREET
DENVER, COLORADO 80211
(303) 458-5201



ALLUVIAL AQUIFER, TEMPERATURE AND pH VS. TIME, G-5 S-22

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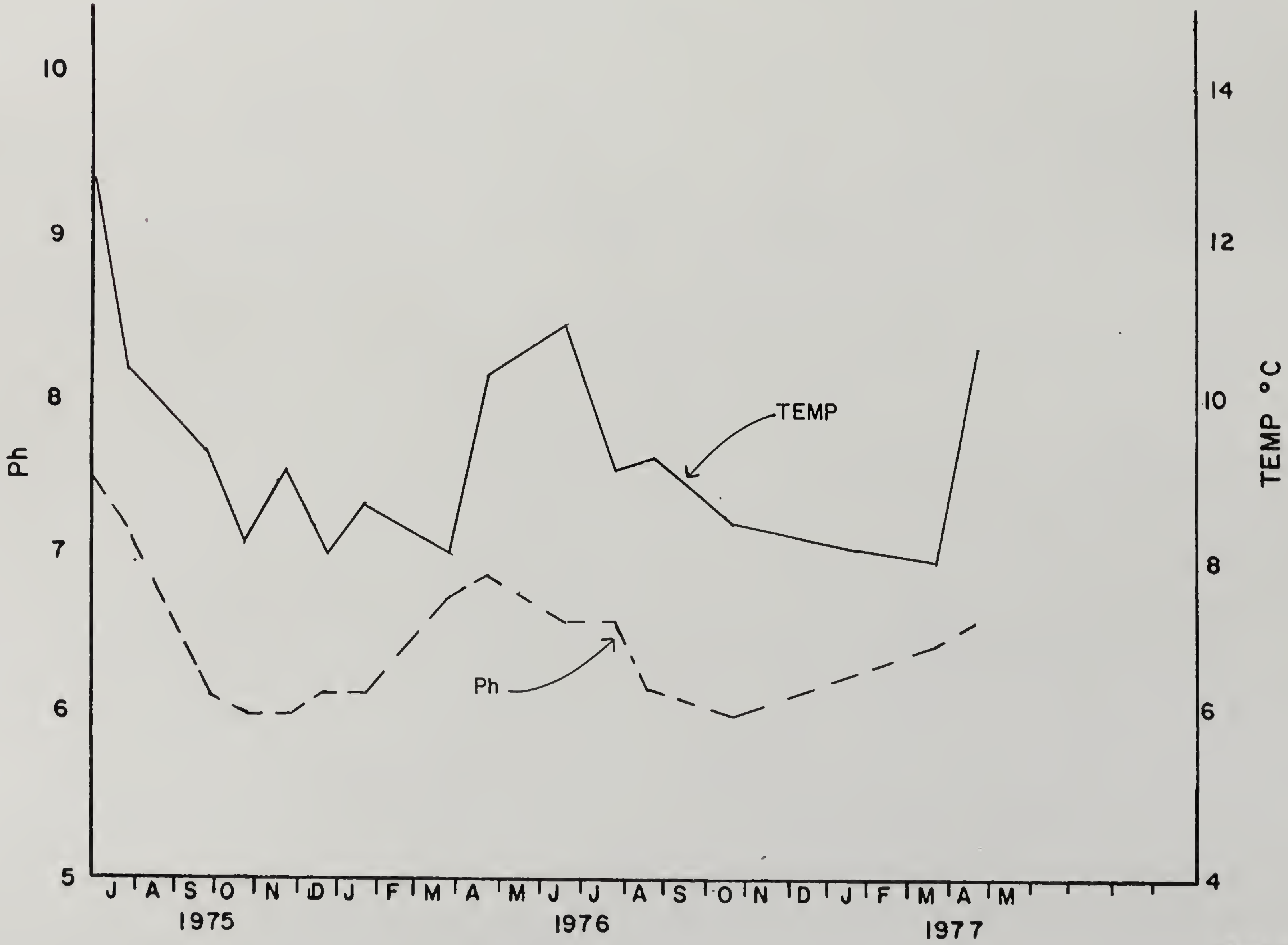
2420 ALCOTT STREET
DENVER, COLORADO 80211
(303) 458-6201



ALLUVIAL AQUIFER, TEMPERATURE AND pH VS. TIME, G-5 S-23

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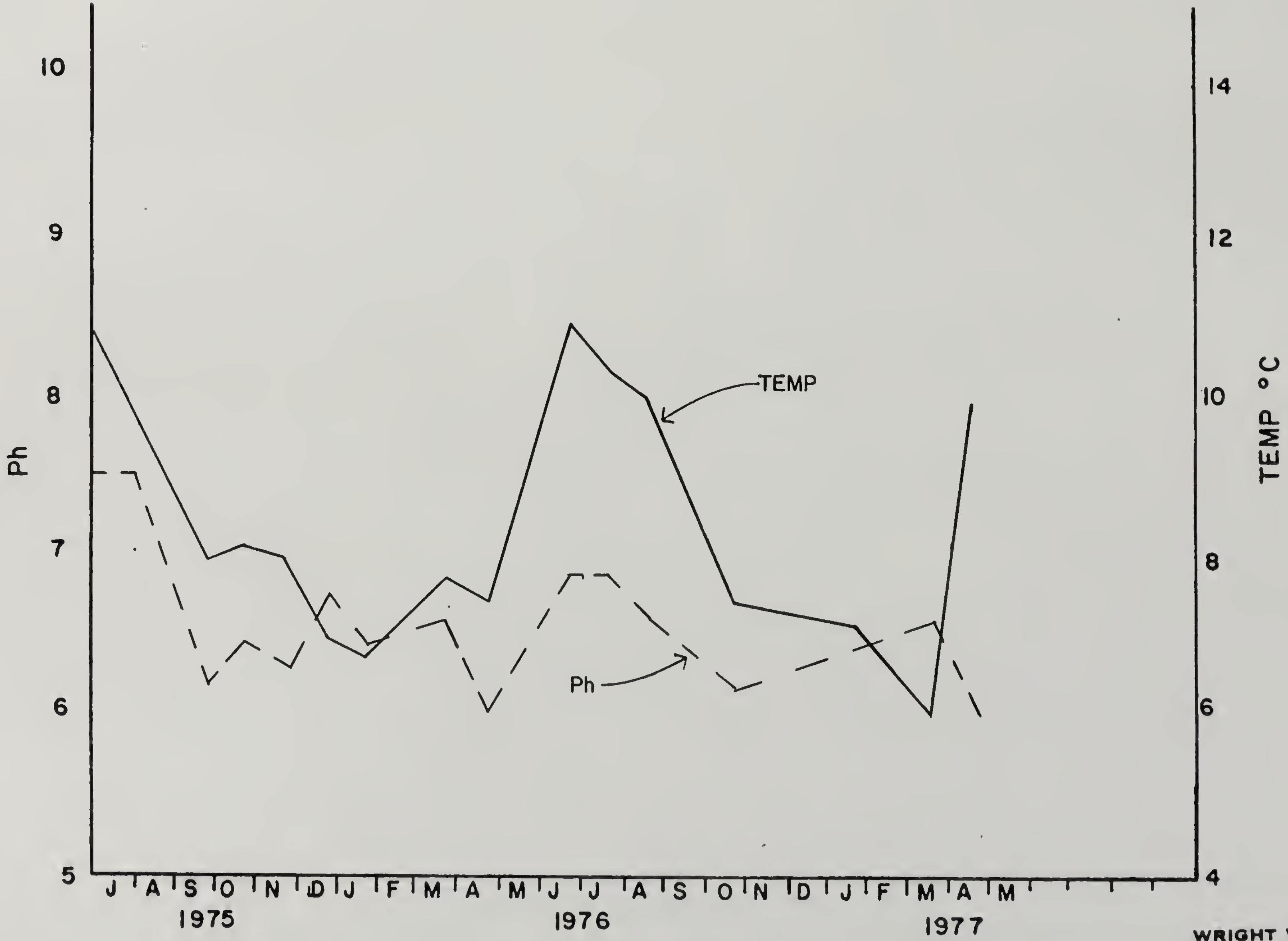
ENGINEERING CONSULTANTS
2420 ALCOTT STREET
DENVER, COLORADO 80211
(303) 458-6201



ALLUVIAL AQUIFER, TEMPERATURE AND pH VS. TIMES, G-5 S-24

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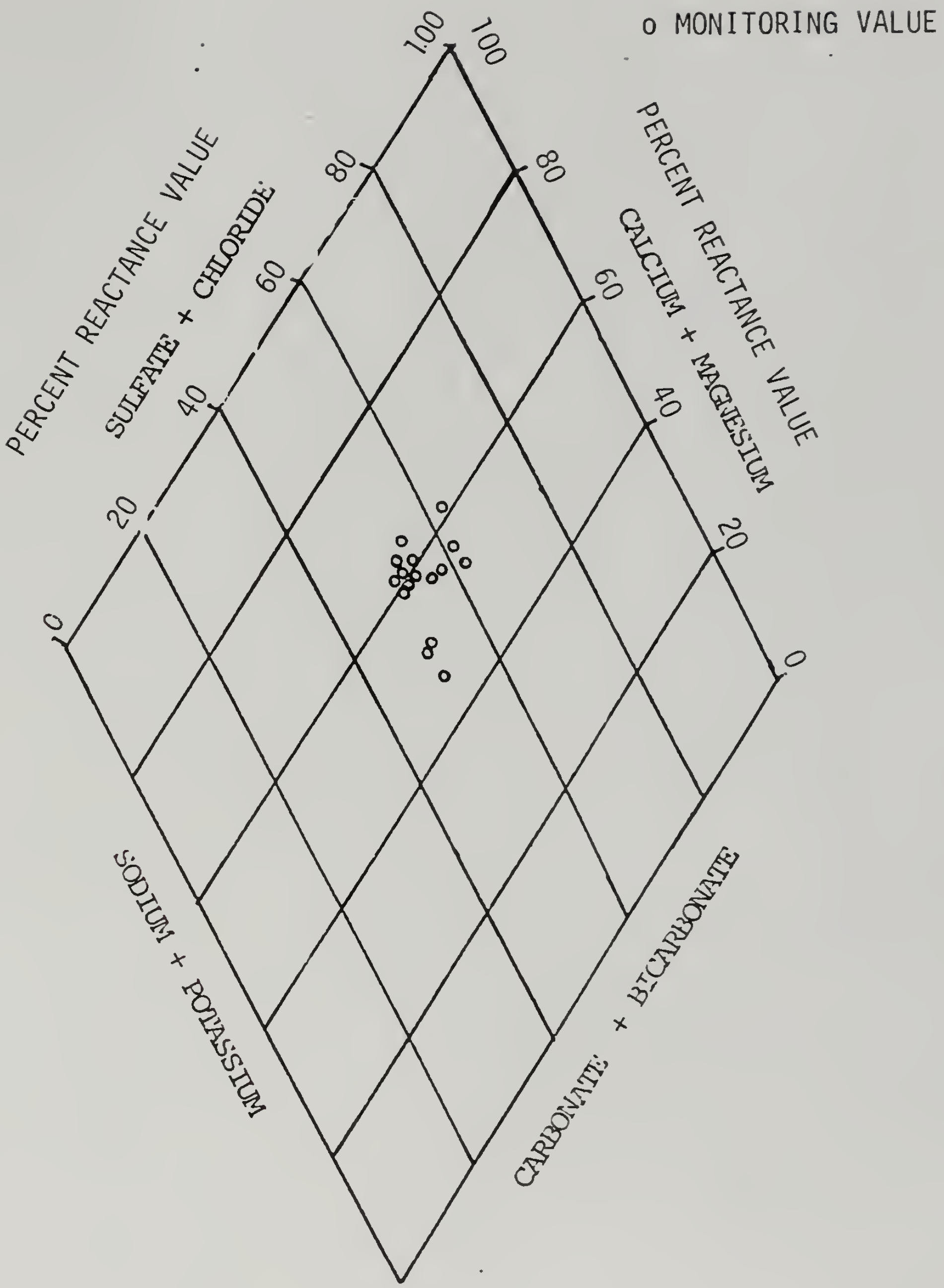
2420 ALCOTT STREET
DENVER, COLORADO 80211
(303) 428-8201



G-S S-19
ALLUVIAL AQUIFER
TRILINEAR DIAGRAM

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DENVER, COLORADO 80211
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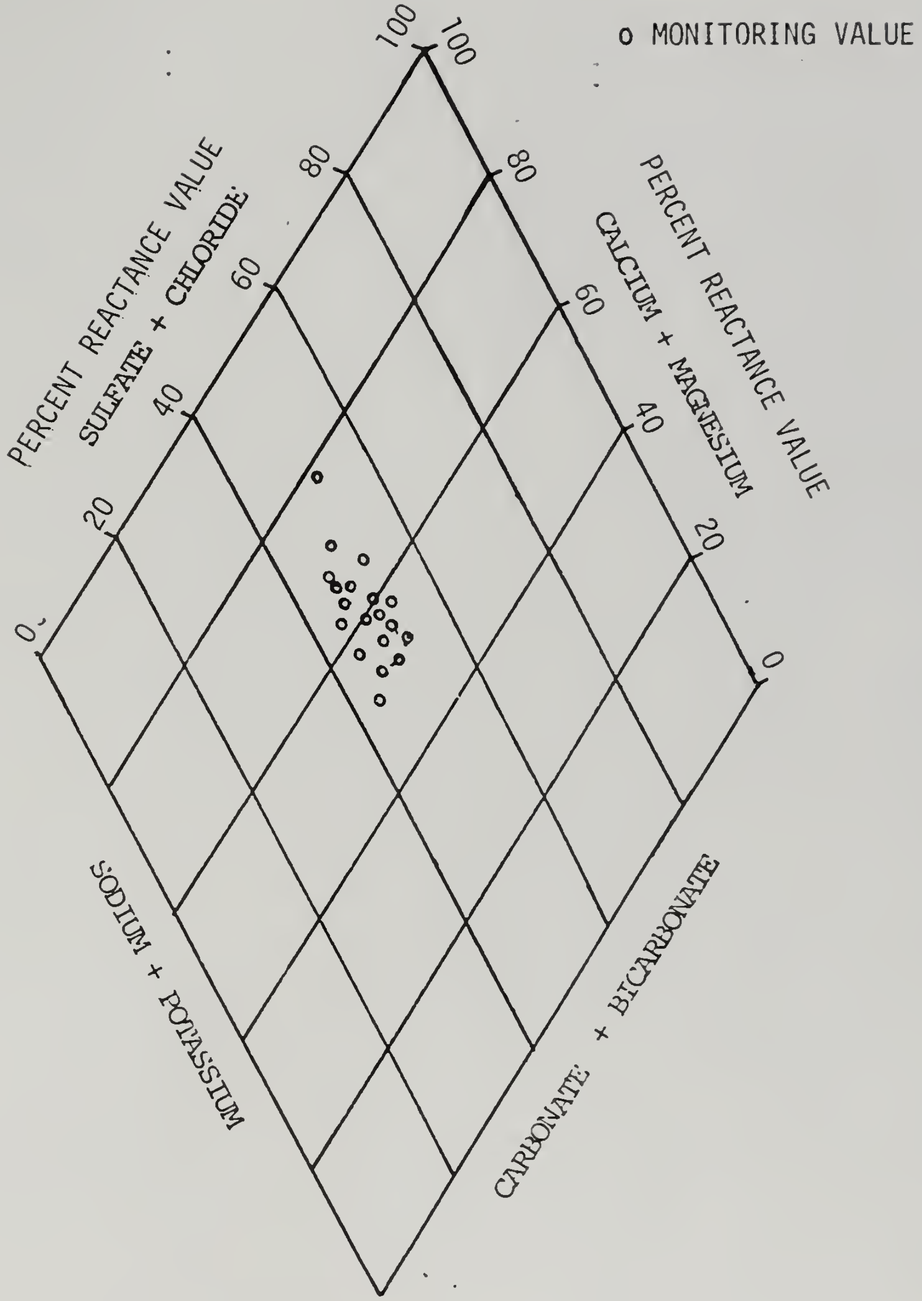

G-S S-22
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TRILINEAR DIAGRAM

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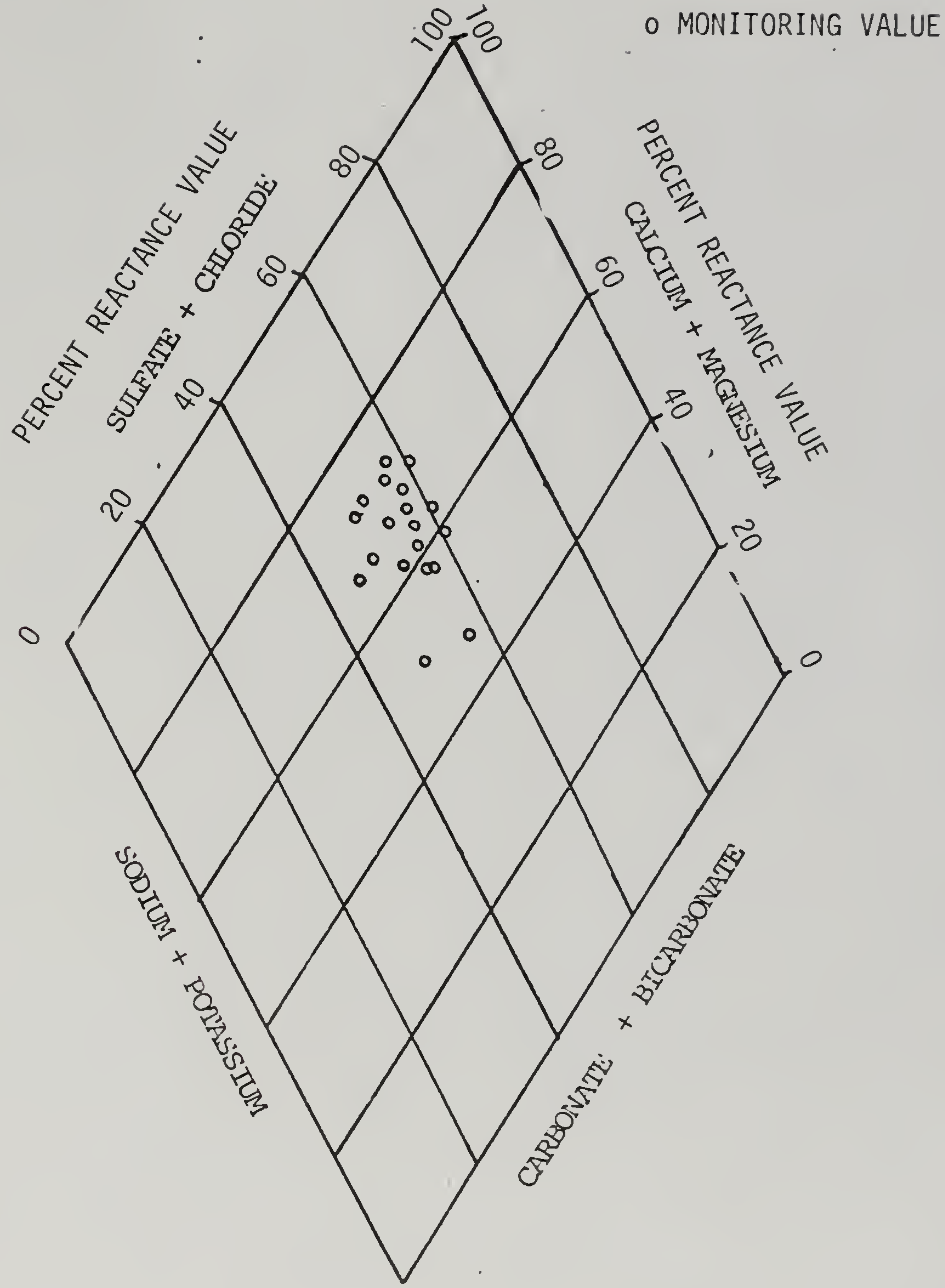

G-S S-23
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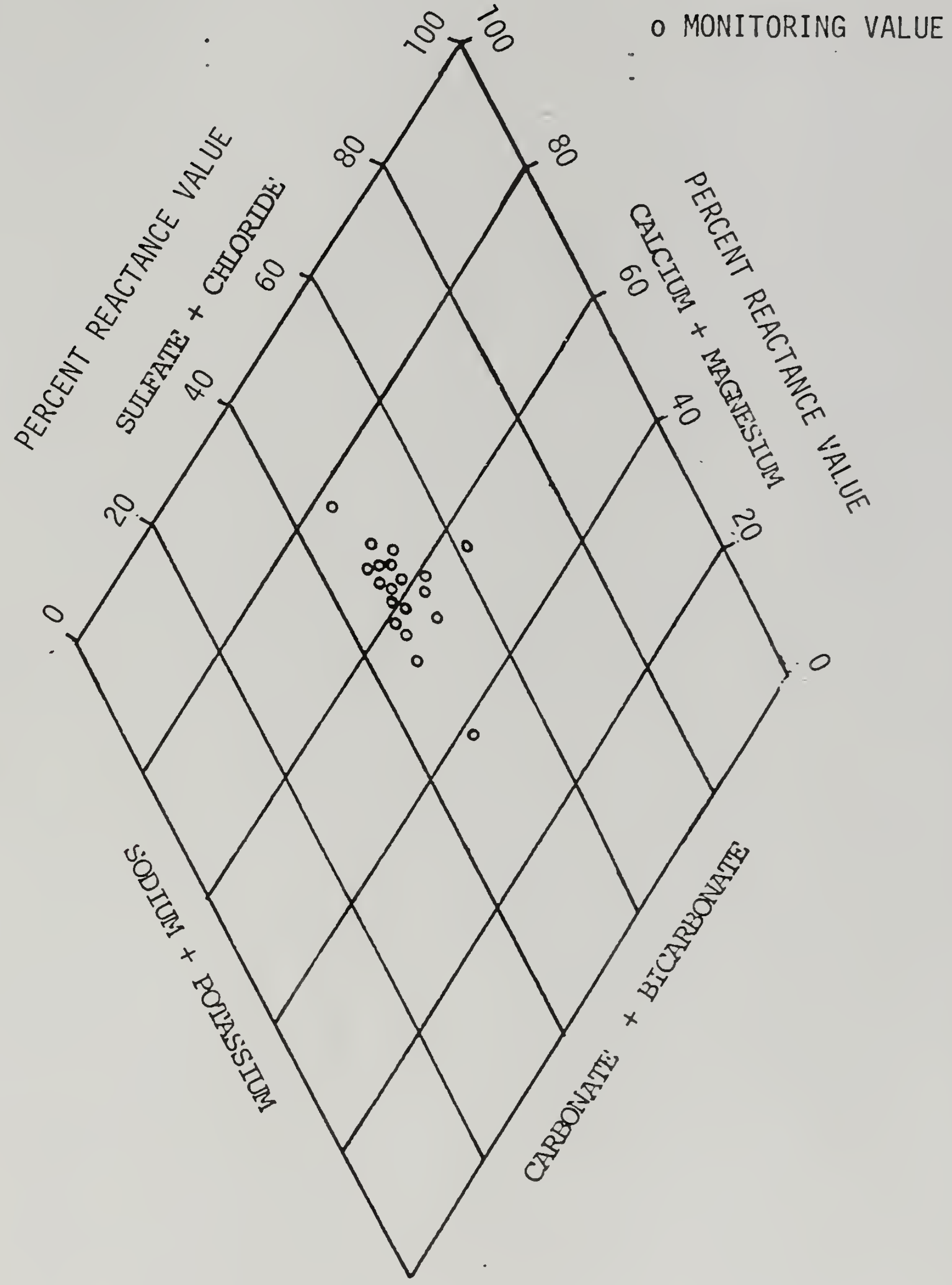

G-S S-24
ALLUVIAL AQUIFER
TRILINEAR DIAGRAM

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DENVER, COLORADO 80211
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Form 1279–3
(June 1984)

BORROWE

TN 859 .C64 R564
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Progress report
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OFFICE OF
AREA OIL SHALE SUPERVISOR
[illegible]